The Builder.

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Some Plain Truths in regard to the London Water Question.

THE total collapse of the London water companies, who, after suggesting an interval of a week in the Local Government Board Inquiry in order to consider whether they could modify any of their demands, at the end of that time withdrew them entirely, was a dramatic termination to the inquiry hardly expected by even the most sanguine opponents of the policy of the companies. The fact that they should have felt under the necessity of taking this course, after the drastic and wholesale demands put forth in their recent claim for revised regulations, is a blow to their prestige from which they will not readily recover, and shows how fully they must have felt compelled to realise the general and determined nature of the opposition which their attempt at forging new fetters for the London householder has aroused. In fact, had Government made any attempt to enforce these regulations there would have been something like a public insurrection. That the water companies, whose prolonged existence has for some time been threatened, and who have become more and more unpopular of late years, should have chosen the present juncture to show their hand in this way, and to formulate demands that would give them an absolutely tyrannical power over those who are necessarily their customers, seems like a new illustration of the old proverb—*Quos Deus vult perdere, prius dementat.*

It is to no purpose to say that under any system of water supply it would be necessary that a strong official inspection should be maintained over fittings, in order to prevent waste. Unless supply were by meter—on which point we may have a word to say further on—such inspection would no doubt be necessary; but it is one thing to have inspection carried out in the interests of the public and by a public authority, and another thing to have it carried out by a private trading company in the interests of their shareholders. The mere fact that the supply of a necessary of life and health, like water, to the largest and most crowded city in the world, should be in the hands of private companies who are trading in it to their own advantage, is an anomaly so monstrous that it is a wonder that public opinion has not long since risen up in arms against the continuance of such a system. As to the pretence put forward by the representatives of the water companies at the recent inquiry, that their proposed regulations were for the good of the consumers, the statement involves such a degree of unblushing impudence as one can hardly adequately characterise in parliamentary language. They know perfectly well, for example, that the storage of water for family use in large cisterns has been condemned by all hygienic authorities as leading to insanitary conditions, and yet they expect us to believe that in trying to compel the use of larger cisterns than ever, so as to enable them to interrupt constant supply whenever it is convenient to them, they are actuated only by consideration for the convenience of their customers! It is not worth while to refer to other similar points in the evidence offered to the Local Government Board Commissioners; it is all in the same strain, and offers an example of cynical indifference to public opinion which seems almost incredible.

The plain truth of the matter is that, partly owing to this false position of the water companies as traders in a necessary of life, and the influence they possess in many quarters,* the question of London water supply has come to be regarded and treated almost entirely as a political stalking-horse. We scarcely ever come across an utterance on the subject which, if traced to its origin, is really concerned with what is best for the London public. We find one water scheme recommended because it is the hobby of a particular party in the London County Council, and they cannot bear that the other party should beat them. The same scheme is opposed by other persons because it would be against the interests of the water companies, for whom this or that person is really though not nominally acting. This is really the history of all that long paper and discussion at the Surveyors' Institution, recently reported in our columns. Mr. Middleton's paper was in many respects a very able one; but Mr. Middleton was a witness for the water companies before the Royal Commission; his paper all went to show that the present provision for water was sufficient for many years to come: "argal" (as the grave-digger in "Hamlet" says) if that is so, why disturb the water companies? That was not said, but that was what was meant. Otherwise, how are we to explain the presence at the meeting of two eminent legal counsel, both of whom have been employed for the water companies, and their obvious mission to scoff at any speaker who opposed the *status quo?* Eminent barristers are not professionally interested in water engineering, nor are they, we believe, in the habit of attending meetings on subjects in which they are not interested unless there is some special reason for their attendance; and it would be interesting to know on whose behalf and on what grounds these eminent legal luminaries attended at the Surveyors' Institution. It was not in the interests of the London public at all events, nor were those interests fairly represented in the discussion on that occasion.

One of the results of the fact that water has been so long supplied to London by trading companies is that the whole class of water engineers, and those who are in any way connected with the subject of water supply, have got into the habit of regarding water not as a substance to be supplied as liberally as possible, but as something which is to be dealt out grudgingly, and in the use

* It is perfectly obvious, for instance, that some important journals, for whatever reason, have completely taken up he cause of the water companies.

of which the inhabitants of a city are to be taught and compelled to be as niggardly as possible. This was obvious over and over again in the discussion at the Surveyors' Institution. One engineer after another spoke as if the great object was to reduce the use of water to the lowest possible quantity. The more copious use of water for ablution, which is fortunately increasing every year, was actually spoken of as if it were not only a folly but a kind of moral aberration which was to be regretted and should be put down compulsorily; one engineer suggesting that with proper rules and regulations it would be possible again to reduce the measure of supply to the twenty-five gallons per head which he remembered as obtaining in happier and more enlightened days. Some part of this wrong-headed movement for curtailing the use of water is probably due to sheer ignorance. Some of the men who are efficient water engineers are men of otherwise little general education, and whose own habits of life do not enable them to form any idea of the extent per head to which water is used, and beneficially used, in the best class of houses. Waste of water,—*i.e.*, the running away of water which has not been used at all, is always to be deprecated. But the copious use of water is not waste; on the contrary, it is one of the most important conditions of healthy life in large cities, and we are inclined to think that if even the superior class of engineers who lay down the law that thirty, or thirty-five gallons per head is an ample supply, were compelled to restrict themselves to the contents of a 30-gallon cistern filled in the morning, and to draw from that for everything for the day—including, it must be remembered, not only personal ablution, but cooking, washing up, and what may be included under the general term of "scavenging," they would find out before the close of the day that they were short of water, and would reconsider their statements.

The two points to be prominently kept in mind, then, in the future consideration of the question of London water supply are—first, that it is a question which no one has any right to consider except on the broad ground of public health and the public good, and that all importation into the question of merely political motives — the success of this or that party or this or that corporation, are not only from the purpose, but, in connexion with such a subject, are absolutely immoral. The second is, that a copious, and not a niggardly supply, is what is wanted for a great city; that the object should be not to see how little water you can give people, but how much. Whether, by means of impounding reservoirs, the supply of the Thames can be made to yield enough for the future supply of London, or whether it will be necessary to seek an auxiliary supply from a distant source, are questions of detail. We are inclined to think that the auxiliary supply will prove to be necessary. But whether it prove to be so or not, the general principle to be kept in mind is that the public good alone is to be considered, and that an ample supply is demanded, and will be more and more demanded with every decade. There is water enough in this country for all to have an ample supply; the only difficulty is to collect it at the places where it is wanted.

We have referred to the question of supply by meter; and without pronouncing decisively in its favour, we think it is a point to be kept in mind. What is the precise reason of the violent opposition to it on the part of the water companies and their supporters we do not exactly understand; but as there is that opposition, we may take it for granted that in some way they regard it as disadvantageous to themselves and favourable to the consumers. The most absurd reasons were adduced against it at the Surveyors' Institution meeting; among other things, that it would be impossible to furnish the number of meters necessary, those who used this argument apparently forgetting that there is a gas meter in every house in London: why is it any more impossible to furnish a water meter? The really valid objection to meter supply is that the poorest class, if charged by the amount they used, would endeavour to dispense with the use of water altogether. This, however, might be met by placing houses below a certain low standard of rental on a rate. The advantage of a meter supply would be that the onus of keeping his apparatus watertight and in proper order would then be thrown on the householder, who would certainly not fail to see to his fittings in that case; and the whole expense, trouble, and irritation inseparable from official inspection, whether by a government or a trading company, would be done away with. There may be reasons of greater urgency on the other side, but we have not heard them yet. The question is, at all events, one which should be kept open for due consideration in connexion with the future of London water supply.

SILVER AT THE BURLINGTON CLUB.

THE loan exhibition of silversmith's work now on view to members and their friends at the Burlington Fine Arts Club, is not only one of quite exceptional richness and beauty, but it has a special interest in regard to the fine character of the English works exhibited. Some of the Flemish and Spanish objects exhibited are more sumptuous in style, but for refined beauty of design there is nothing superior to the best English work exhibited. The cup and cover gilt, No. 1 in case C, a piece of early seventeenth-century English work, has such a classic refinement of detail that at first glance it suggests rather work of the best period of the Italian Renaissance. The bowl in this instance is in the form of an ostrich egg. To the moulding on the cover are hinged what the catalogue justly calls "three exquisitely designed vertical straps in the form of caryatide figures," which secure the egg. No. 3 in the same case, of slightly earlier date, has the same refined Italian character. The works in this case are all English, and though some of them are of small size and comparatively simple in design, they are more truly artistic in feeling, and especially in refinement of outline, than many of the larger and richer works in other cases. We may also notice in Case D (also all English work) the cup and cover numbered 19, a melon shell mounted as a sea-monster, supported by dolphins on a circular base.

It would be impossible to describe the collection in detail; the task would be endless. It would be more to the purpose here to consider some of the various ways of treating silver which are illustrated in different classes of articles exhibited. We find some articles in which the object is to take the eye captive by a universal richness of treatment, leaving no portion of the surface untouched. A typical example of this is the large German cast and embossed cup, No. 1 in case F, long believed to be a work of Cellini's, but now recognised as of Augsburg make. We confess we are surprised at the belief that it was Cellini's; it has not the Italian character, and it has what is so often the characteristic of German work, richness of surface without refinement of line. The English cup in the same case (No. 3), sufficiently of the same character and size to be called a companion piece, though less sumptuous than the German example, is better in outline and so far more artistic. It is in form that both English and Italian pieces assert their superiority to German. No pedigree is given of the massive silver table from Wentworth Castle, shown in case G, but we should be surprised if it is not Italian; the bold and yet finished and graceful form of the supports is in the highest style. There is something similar in character in the two gueridons (tall circular pedestals) in Case K at the opposite end of the room, lent by her late Majesty; there is here the same richness of decoration without losing sight of clearness and precision of form in the supporting parts, especially in the finely-designed scroll feet (why these are called "marine-looking" in the catalogue is not apparent). There is, however, no statement of place or date attached to these either. It would be interesting to know their artistic history.

Most of the fine and large cups and tazzas in Case I are English, one of the finest of all being one of the smaller objects, viz., Mr. Kennedy's two-handled gilt porringer and cover, standing on ball feet with a removable outer casing of silver, pierced and embossed with a design of foliage intertwined with children and birds; a perfectly beautiful work, of the date 1670. Among the various other articles in this case we may contrast with the last-named very rich piece of work the two large plain flagons, Nos. 67 and 72, the body carefully modelled with a pronounced entasis; there is little ornament, the whole effect is obtained by the large and ample modelling and curvatures of the main lines; but these are in their way two of the finest pieces of work in the case, and should be studied for the effect to be obtained by mere line apart from elaborate surface ornament. In the large cup lent by St. John's College, Cambridge, it is worth notice, as a point in design, that the ornament is too flat to have any effect in comparison with the large scale of the cup, and looks weak in consequence.

In Case J we come on a different school, mostly Flemish, German, and Spanish work; and the first two objects in the numbering, a Flemish chalice and a Spanish ewer, are both typical examples of the sumptuous character of decoration of this school; for just as with point lace, so it is with silversmith's work, there is a very strong similarity between Spanish and Flemish work. Among the objects in this cabinet three German cups (No. 4) are noticeable for a marked specialty of character and design; they have three bands of engraved ornament, one over the other, with very good effect, and are exceed-

ingly picturesque objects, though smaller and less costly in appearance than many others in the case. Among the most characteristic objects in this case are also the two small and rather squat German cups, Nos. 21 and 26; low wide cups each on a shallow moulded circular foot. A large oval dish—Spanish, late seventeenth century—lent by her late Majesty, is one of the examples which show that richness of surface embossing and chasing will not atone for bad form: the whole design is ragged in outline. We may notice also that in the cup No. 38, the figure of an armed warrior makes a very weak stem, quite out of keeping with the scale of the cup; besides which, a figure should never be introduced where it must be used as a handle for the grasp of the hand; it is degrading the figure to use it in that manner.

With case L we come to some of the ecclesiastical designs, in which we find, almost for the first time in the collection, architectural forms frankly used in silver work. It shows how the cathedral forms of architecture had become synonymous with the notion of religious art, that we so constantly find them used in articles which are specially intended for religious use. Thus in case L we find a "censer of architectural design," on a hexagon plan, with buttresses and pinnacles at each angle; a late fourteenth century English work. No form of design could be more unsuited for a swinging censer; it looks as if it must come to pieces in use. A less unfitting use of architectural detail is found in the fine reliquary, No. 8 in the same case; a longitudinal gabled form, with heavy angle pinnacles perched on the top of foliated capitals in a manner which would never have been tolerated in actual built architecture. This is nevertheless a fine piece of work of its kind (French, of the fourteenth century); only it is worth note that the scroll design on the slope of what would in actual architecture be the roof is far too large in pattern, and quite out of scale with the rest of the design. Case M contains a remarkable German cup of architectural design, the stem consisting of elaborate tabernacle work, exceedingly bad to handle; it is noticeable though not noticed in the catalogue, that here we have an example of the especially German vice of apparent penetration; the upper portion of the finial, above the cup, being designed so as to appear like a continuation of the stem carried through the base of the cup. Nothing could be in worse taste, though the workmanship is admirable. In the same case, assorted oddly with the mediæval work, are the two or three examples in the connexion of Classic work; a Græco-Roman cantharos (6), a libation cup of pure Classic form, assumed to be Greek of the fourth century B.C., and in excellent preservation; a little Græco-Roman model amphora; and a very beautiful little nude statuette of Apollo, probably Gallo-Roman. A Flemish chalice (10) is another of the elaborate architectural designs, with a stem so delicate in its detail that one would be afraid of grasping for fear of injuring the work. In case N are several fine monstrances, in which architectural forms are largely used; a German one (No. 5) is remarkable for the fine and effective manner in which miniature window-tracery is made use of; and an Italian example (No. 2) is interesting for the manner in which the feeling and detail of Italian Gothic are reproduced on a small scale. There are two more architectural censers, as unsuitable for their purpose as the one previously mentioned; and a rather simple chalice (10) notable for the charming and unusual manner in which a little crucifix in relief is introduced on one of the lobes of the spreading base, the remainder of which is quite plain. This little incident gives quite a special interest to the work.

Among the remaining exhibits we have only space to notice two or three. One of these is the splendid nautilus cup of German work lent by her late Majesty, with a figure of Jupiter above and a figure of Neptune on a sea-horse supporting the cup, a splendid piece of work much more Italian than German in general feeling (date 1600); and, in Case Q, a bowl of Venetian Gothic work of the fifteenth century, with a design formed of radiating scallops in ogee curves, enriched with foliated ornaments and animals, and which is a perfect model of style for silversmith's work. It is stated to have been found in one of the canals of Venice. Another work in Case R, which should not be passed over, is an exceedingly fine reliquary cross, described as "French or German *circa* 1340," with the peculiarity of a double arm to the cross, one above the other; the bold and effective plan of the base, and indeed the whole design, are in the highest style of art.

We have merely touched on some of the salient points in this splendid collection, which every one interested in decorative art should see. Owing to the liberality of the committee and members, access to it is easy for all who care for the subject.

NOTES.

Proposed Monument to the Queen.

IT seems to be intended, as might have been expected, that an important monument to our late beloved Queen should be raised somewhere in London, though it has not transpired that any special site or any special idea in regard to the form of the monument has been proposed. It is to be hoped that whatever is done will be done in a manner that shall be artistically worthy of the nation and of the occasion. We must expect to find that various absurd proposals will be made by people who have pet theories to promote; and already that irrepressible person, Mr. Shaw-Lefevre, has attempted to revive the idea of a modern Gothic chapel attached to Westminster Abbey, which has been condemned over and over again. What we ought to have is a great architectural and sculptural monument, for which there should be a competition open to all British artists.

The County Council Election.

ON every governing body, municipal or imperial, there must be progressives and anti-progressives, and when the progressives temper progress with prudence, they form the party to be supported. The Progressives on the London County Council have—as is natural — made mistakes, but they are earnestly bent on improving the condition of the Metropolis, and they bring to the work a lively enthusiasm. Every one, therefore, who desires to see London improved should be gratified at the result of the recent election. The attempt of the so-called Moderates to confuse imperial and municipal questions was ill-advised and deserved to fail. The English people have always been in favour of steady progress; they kept that aim in view in politics till all the great political grievances were removed. The democracy of London for a long time has not known its strength in municipal matters, and has not understood what it wanted. Now it has, after some years' newspaper reading, come to the conclusion it wants the water supply in its own hands, and it wants better locomotion. It has been so often told that London is behindhand that it has decided to get something done. Having thus made up its mind, London was certain to vote for the Progressives. If the Government thwart the wishes of London, it is equally certain that in no long time the Metropolis will return Liberal members to Parliament.

Electric Lighting Regulations.

SIR COURTENAY BOYLE presided at a Board of Trade inquiry at the Westminster Town Hall, on the 1st inst., to consider the question of whether electric light companies are to be allowed to raise the pressure of supply without the consent of the consumer. The action of the Westminster Company, in applying that the proviso in one of the Board of Trade regulations, which insists that the consent of the consumer must be obtained, should be altered so as to allow the question being settled by an arbitrator appointed by the Board of Trade, led to this inquiry. Mr. Balfour Browne pointed out that the Westminster Company had divided their gains with the consumers without pressure from the London County Council or the Board of Trade. There were only eight clients of the company who preferred the 100 volts, notwithstanding that they were charged 8d. a unit as against an average charge of 4d. for the rest of the consumers. This necessitated a double set of mains and put the company to great expense. It would be for the benefit of the great bulk of their clients if the eight low-pressure consumers would agree to change over. The various opposing counsel, representing the City Corporation, County Council, &c., submitted that the Board of Trade could not alter this regulation, as it was not a regulation at all. The right of existing consumers to a 100-volt supply could not be altered without their consent except by an Act of Parliament. Sir Courtenay Boyle decided that this inquiry might discuss whether it was expedient for the Board of Trade to alter this regulation. Technical evidence of a one-sided character having been given in support of the alteration, the inquiry was adjourned to this week. In our opinion this inquiry would never have been necessary at all if the supply companies had approached their consumers with more consideration in the first instance. Having in many instances simply tricked their consumers into accepting the higher voltage without any reduction in their tariff, and having made wild assertions about increased efficiency, no danger of shock, &c., they now pose as much injured bodies because a few consumers are willing to pay exorbitantly for the more desirable lower pressure.

Municipalities v. Private Companies.

THE adjourned discussion on Mr. Madgen's paper on "The Electrical Power Bills of 1900" at the Institution of Electrical Engineers

last week gave rise to an unexpectedly interesting debate. Mr. Hammond criticised the paper very severely. He pointed out that the questions that really concerned the Institution of Electrical Engineers were those connected with the proper size of the distributing stations and the best methods of distributing power, and not those connected with certain real or imaginary restrictions on "free trade" in electricity. Mr. Madgen's paper was a dirge, and the Institution would be ill-advised in appointing a committee to make the path of the company promoter easier. If we were behind other nations in electric lighting, it was not due to restrictive legislation, but simply to the keen competition that was going on with cheap gas. Electric lighting in this country had often to compete with gas at 2s. per 1,000 cubic feet, whilst on the Continent and in America the average price of gas was three or four times as great. He pointed out that in this country municipalities were, as a rule, supplying electricity to consumers at a much cheaper rate than companies. He also mentioned the excellent municipal electric-lighting stations there were in Germany. Professor Ayrton gave his experience of one of the new power companies. He had advised a small town in the North to get its electricity in bulk from this company instead of laying down a station of its own. The company, however, refused to supply at a cheaper rate than 3d. a unit, which was obviously prohibitive. This statement of Professor Ayrton's is an exceedingly serious one, and Mr. Madgen, in his reply, accentuated it by saying that he thought the company ought to have charged 6d. a unit. Several directors and promoters of various power schemes spoke strongly against what they called the "dog in the manger" policy of municipalities, and the general feeling of the somewhat sparsely attended meeting was obviously with them.

Owens College, Manchester.

AN appeal is made for subscriptions towards a sum of 150,000*l.* in completion of the endowment and equipment of Owens College, of which the first jubilee will be celebrated in the course of the current year. The Committee, of which the Duke of Devonshire is Chairman, desire to establish new Chairs of Architecture, English Literature, and Hebrew, to provide for hygienical and bacteriological investigation, for research fellowships, and for a pension fund on behalf of the professorial and general staffs. It is stated that an immediate sum of 20,000*l.* is needed for the extinction of existing liabilities, more particularly in respect of the medical side of the college, and that at present the yearly income fails to meet the annual expenditure. Owens College, which was founded in 1846 by John Owens, a Manchester merchant who devised nearly 100,000*l.* to trustees for the establishment of a teaching University (being the first after its kind in the provinces), and was opened in 1851 in a house that had formerly been the residence of Richard Cobden. Some twenty years afterwards the college migrated to the new buildings erected from the designs and plans of Mr. Alfred Waterhouse, R.A., and since enlarged by Messrs. Alfred Waterhouse & Son. In 1867 the capital of the foundation was increased by contributions to a total of about 400,000*l.*, and in 1880 a charter of incorporation was granted for the establishment of Victoria University, to consist of affiliated colleges having their centre at Manchester. With Owens College has been amalgamated the Royal School of Medicine, founded in 1824; Dr. J. Prince Lee, first Bishop of the diocese, bequeathed his library, containing upwards of 6,000 volumes, and to the buildings have been removed the library of the Medical Society and scientifical collections from the Manchester Museum.

No. 4, Whitehall-gardens.

IN the course of next month will be offered for sale at the Mart the Crown lease of No. 4, Whitehall-gardens. The house was erected for Sir Robert Peel from the plans and designs of Sir Robert Smirke, who was the architect also of Peel's country seat at Drayton-Bassett, near Tamworth, where the portrait gallery, added at the south-eastern corner of the house, was completed in 1846, after the designs of Sydney Smirke (see the *Builder*, May 10, 1845. It was at Whitehall-gardens that Sir Robert Peel formed the fine collection of Dutch, Flemish, and English pictures, comprising paintings by Rembrandt, Vandyck, Teniers, I. and A. Ostade, A. and W. Van der Velde, Lely, Reynolds, Sir Thomas Lawrence, and Wilkie, together with portrait busts of Pope, Prior, Sir Walter Scott (by Chantrey), &c., the greater portion of which was dispersed at auction last year.

Hogarth's House, Chiswick.

WE learn that this house, which stands on the west side of Hogarth-lane, is about to be pulled down for the erection of villa residences upon the site, including the garden. The house, having been for some time previously out of repair and rented in tenements, was taken in 1890 by the Typographic Etching Company, for the Hogarth Works. In the following year an attempt was made to collect a sum of 500*l.* for the establishment of a maintenance trust, and to clear away some buildings that had been intruded on the south side. The house was built in the earlier years of the eighteenth century, of red brick with rubbed brick dressings, and has a bold wooden bay-window on the first floor of the north and principal front, with a moulded wooden eaves course (see the view in the *Builder* of February 8, 1890). Hogarth bought the house in or about 1750, after he returned from his visit to Calais. He occupied it as a summer residence until his death on October 26, 1774, in Leicester Fields. He left the house to his widow, who demised it to her relative, Mrs. Mary Lewis, at whose death in 1808 it passed to some persons named in Mrs. Hogarth's will. The house was subsequently occupied by Henry Cary, the translator of Dante, who died in 1844. It is said that the two leaden urns upon the gate-posts were given to Hogarth by Garrick.

Southwell Minster.

AT a meeting of the Fine Arts Society on Thursday, February 28, a lecture was delivered by Mr. F. H. Evans on Southwell Minster, illustrated by limelight views from original photographs. The lecturer briefly outlined the history of the Minster, and strongly condemned the more recent alterations, which, in the case of the introduction of the organ, have hidden much beautiful detail, and spoiled the interior effect. Of the large number of carefully-selected photos that were put upon the screen, those of the Norman work throughout the church were exceedingly interesting, showing variety of feeling and individuality, of which the caps now hidden behind the organ are particularly charming specimens, unique in their archaic character. Mr. Evans has also secured a splendid collection of details from the rood-screen, a beautiful example of Late Decorated work. Mr. Doran Webb, who was in the chair, at the close of the lecture emphasised the necessity of suppressing the modern tendency to give undue prominence to the organ as a feature. With this we quite agree where it is an old church or cathedral that is under consideration, but in the case of modern church design the organ is so important a factor that it should be an essential part of the design, not a mere incident to be pushed from sight.

THE ARCHITECTURAL ASSOCIATION:

THE PARIS EXHIBITION, 1900.

THE ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, the President, Mr. W. H. Seth-Smith, presiding.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Association, viz., Messrs. D. Hill and A. Gilbert Scott.

On the motion of the Chairman, a vote of thanks was accorded to Mr. R. C. Harrison for presenting to the library forty volumes of the *Builder*.

The Chairman said he would like to remind members of the special general meeting, to be held that day week, for the purpose of considering a scheme of proposed day classes for the Association. No doubt a good deal of interest would be felt in regard to the Committee's proposals, and there would be a good meeting on the occasion.

The Chairman then announced that Mr. A. H. Hart's lectures on "The Architect's Use of Colour" would commence on March 13. The subject was one of considerable interest to architects, and any gentleman desirous of joining should send in his name to the Secretary at once.

The Chairman then called on Mr. E. W. M. Wonnacott, the Cates Prizeman, to read a paper on "The Paris Exhibition, 1900," illustrated by a large number of lantern slides, as well as a number of drawings hung round the room.

Mr. Wonnacott, in the course of some preliminary observations, said he would like to explain that last year a travelling studentship was offered for the study of the buildings of the Paris Exhibition of 1900, and it was to Mr. Arthur Cates, the father of the profession, if he might call him so, that the Association owed a debt of gratitude in offering the studentship, and for his generosity in handing over to the treasurer the funds necessary for the purpose. The Committee of the Association was charged with finding a suitable candidate, on certain conditions which he need not recall, except one, viz., that the person chosen must read a paper on the subject of his visit before the Association. The Committee's choice having fallen on him, he stood before them in fulfilment of the conditions imposed.

Mr. Wonnacott then read the following paper:—

Historical.—Every eleventh year France, since 1855, has invited the nations to come and vie with her in the great industrial shows she initiated. The Exhibition of last year was long foreseen, but it nevertheless was decided on in a hurry, for Berlin had intended to close the century with a magnificent universal exhibition there, but France, ever jealous of her next door neighbour, sailed in a point nearer the wind, and bespoke the date mentioned. A presidential decree settled everything. France was to have the next Exhibition. Whichever nation it was that was to have the honour of holding the international show, there was the opportunity of closing in a magnificent way the century of artistic, scientific, and commercial

enterprise that has not yet been equalled in the world's history, and at the threshold of a new century era, to open the door to unknown possibilities.

Perhaps it will be well to mention here that there is now a feeling—almost universal—that these International Exhibitions are being held too frequently, and one feels quite gorged with them. It would be better to have them forty or fifty years apart, in the same territory, those in the interval being held by the rival nations.

Having fixed the date so early as 1892, we see it took six years to progress to fruition. The services, staff, &c., were settled in 1893, the site fixed in 1894, and the regulations and rules promulgated in 1896, leaving four clear years, in which were to be brought forth the designs (in competition or otherwise) and the erection of the buildings themselves.

It was left to M. Alfred Picard, Inspector General of roads and bridges, the official reporter of the 1889 show, to draft the preliminary ideas of the 1900 Exhibition. On the general lines laid down by him (which included for the first time the right bank of the river), a competition for the supply of ideas was initiated in which 108 competitors entered. Parliament voted a credit of 100,000 francs for the purpose. The competitors were at liberty, by the conditions, to raze everything within the selected boundaries, except the Palace of the Trocadero and the Eiffel Tower. The majority of the competitors favoured the opening up of a new avenue from the Champs Elysées to the Invalides, which would entail the destruction of the Palais de l'Industrie, a relic of the 1855 Exhibition. Round this scheme raged a hot and angry discussion, but eventually it was decided to adopt it, and the avenue (now known as the Avenue Nicholas II.) was almost an accomplished fact. Singularly enough, towards the close of the eighteenth century, the same thing had been talked of by Gabriel, the well-known French architect of that time, when he proposed to shave off the top of the rising ground where now stands the Arc de Triomphe, and to make various extensive improvements in this quarter of Paris. The murmurs of the approaching Revolution postponed its accomplishment until our own day.

Then came the second competition, in 1896, for the arrangement of the Exhibition buildings. M. Picard having decided on the knotty problem of how to provide, on almost the same site, as regards size, as the 1889 show, about triple the area for the 1900 one. The idea being already adopted of an avenue terminating in the Invalides, with a palace on each side of it, next the Champs Elysées, the jury selected nine schemes for the large palace and eight for the small. A final ballot brought out the name of M. Girault as architect for the Petit Palais, while for the Grand Palais were selected (1) M. Louvet, (2) MM. Deglane and Binet, and (3) M. Thomas. Eventually most of these were associated together in the design and construction of the Grand Palais (except M. Binet, who received as consolation the commission to erect a monumental gateway at the principal entrance of the Exhibition). The architects who were placed second in the competition for the Petit Palais were commissioned to execute the architectural decorations of the new bridge, forming the connecting link between the Champs Elysées and the Invalides. MM. Cassien Bernard and Cousin, the architects referred to, were to work hand-in-hand with the engineers already appointed, MM. Resal and Alby.

Staff.—A word as to the staff—the architectural department which worked under the direction of M. Picard. This was housed in a fine red brick building or pavilion, and offices on the Avenue la Bourdonnais. Very complete plans, &c., can be seen in Vols. 13 and 14 of "La Construction Moderne," copies of which can be seen in the Royal Institution of British Architects' library. The building is not of sufficient importance to deserve detailed notice here.

Finance.—Perhaps a word or two on the financial aspect of a great Exhibition may not be without value. In 1867 the State and town furnished a subvention of 12 million francs and a Guarantee Corporation had 6 millions more in hand, but was not called on to pay, there being a balance on the right side.

In 1878 the State, jointly with the town, executed the operation, and there was a deficit of 20 millions, but of this sum 10 millions went to pay for the Trocadero Palace.

But that of 1889 resulted quite otherwise, and the surplus of receipts over expenditure reached the respectable total of 8 million francs.

The 1900 Exhibition, of which the official accounts have been already published, results in a deficiency of over 2 million francs, but this applies to the official work only. There are in addition the unofficial shows also to consider, (670 projects were submitted in the preliminary competition, sixty of them retained for the final selection) which had to pay extortionate rents for their ground space, and were moreover over-capitalised, many of them closing their doors early in the summer. The total amount of capital raised for these unofficial shows was 46½ million francs, nearly 2,000,000*l.* The immense Globe Celeste was the most unfortunate, on account of the disaster to the bridge which fell when the centering was being struck. The show was at once closed by the authorities, and only reopened when the summer was nearly over. "Paris in 1400," was another speculation which ended in ruin early in August, and was for sale then at the break-up price of 2,000 francs. Several of the others were practically bankrupt before they were ready to open their doors to the public, their shares in the market being so much waste paper. An example may interest you: one restaurant, the capital at starting being 10,000*l.*, was re-sold, in three months, for 4,000*l.*, and one month later to a new proprietor for 1,600*l.* Of the others, such as the moving platform, the great wheel, the Maréorama, and the Palace of Optics, the capital depreciated very greatly, in some cases 90 per cent. So we see much money was sunk by the concessionnaires, and nothing was reaped from it.

Also in the case of the Exhibition bonds, the only means of raising money to float the Exhibition at all. Over three million pounds was easily raised by the French bankers by means of 1*l.* bonds, which were greedily snapped up by the public; but they were practically given away, for each bond carried the right of twenty one-franc tickets for admission, a reduction of 25 per cent. on certain side shows, and participation in the drawings of the lotteries, the latter being the only prospect of remuneration on the outlay. But I must weary you no longer with details of this sort.

Works and Construction.—The wreckers (those wolves of the architects, as they have been called) and the navvies were looked after by a Committee of Hygiene. All the immense masses of earth that were moved, whether in foundations, road or tramway cuttings, were profusely sprinkled every day, when work ceased, with pulverised sulphate of iron 100 parts to quicklime 200 parts to every square metre. This precaution to us may seem absurd, but it must not be forgotten that Paris is a very insanitary city, and still abounds everywhere with hidden cesspools and middens. A strong staff of inspectors were told off for this special service of sanitation.

Demolitions.—I have no data of the cost of demolishing the structures that formerly stood on the site of the late Exhibition, but I may mention that the old Palais de l'Industrie was removed for the sum of 200,000 fr., only the colossal group that crowned the structure, by Elias Robert, being preserved. The dome, the "Dome Centrale," on the Champ de Mars site, cost 20,000 fr. to pull down; and the Pavilion of the Town of Paris—from the last Exhibition—20,000 fr. Besides these, there were razed the Palaces of the Fine and Liberal Arts, but I have no items of cost. It is estimated that it would cost, to remove the Galerie des Machines, 1,000,000 fr. if decided on.

Workyards.—The contractors' yards for heavy material were laid out in a most methodical manner, amply provided with tramways and railways, cranes and hoists, and everything desirable to facilitate despatch: and despatch was the order of the day. The daily labour roll amounted to over 5,000 hands, in spite of the fact that everything that could be fitted together before arrival on the site was so done.

There were twenty-three of these workyards, each under an architect, in some cases under two architects.

Stone.—That most largely used was the calcaire grossier, a white freestone largely found in the Paris basin: from the quarries of Château Landon, near Nemours (Seine et Marne), as was used for the Arc de Triomphe: also the stone from the Aisne and Oise Valleys, as the new Louvre: those of Charentenay and Courson (Yonne) as we see in the Hôtel de Ville. The ashlar work of the Petit Palais was a hard freestone from Coutarnoux (Yonne) up to the first band, and above that a freestone from Méry. In the Grand Palais, where there were about 40,000 tons (French)—17,000 cubic metres—used, the lower part was from Villebois, and was the only example I could trace of a quarry-worked stone. All the rest was cut and worked on the site, the freestone being from Euville, Lerouville (Meuse), and Larrys (Bourgogne) for the *socle*, and from Villers-Adam and Vic-sur-Aisne.

We also see pink mottled limestone from the Côte d'Or, or Burgundy, employed in decoration and pilasters, similar in appearance to our Devon limestones. Also grey granites from Calvados, white and golden yellow freestones from Poitevin sources, and the valley of the Oise.

Stucco.—But the material most profusely used throughout the Exhibition for the temporary buildings was the stucco or "staff"* applied over the light wood or iron skeleton of the structures on fireproof lathing or wirework. As most of the buildings were temporary, they were executed almost wholly in this way. This "stuc" (the use of which we can readily trace back to the days of the Romans) was very largely used in the seventeenth and eighteenth centuries, and is now the universal material used by speculating builders in Paris, for the vestibules, staircases, entrées, &c., and an old example can be seen by the curious in the Presidency of the Chamber of Deputies, where the stuc was coloured; the work was by Jules de Joly, then architect of the Palais Bourbon.

Ciment Armé.—Then there was the ciment armé, or concrete with steel cores, used in large masses, profusely used in nearly all the buildings, whether permanent or temporary, especially for staircases and landings, and galleries of wide span. I shall touch on this later when dealing with the Petit Palais.

Steel.—But looking back over the century just passed, the material that has come most to the front is steel. At the opening of the nineteenth century iron or steel construction was unknown except in the form of cast girders and occasional roof trusses, either wholly or partly in iron. But the succeeding years bring us by rapid strides, through the demand for high and wide buildings, and the commercial use of the steel process, past such landmarks as the Crystal Palace of 1851, and the Gare St. Lazare, in 1867 the elliptical exhibition building, in 1878 the machinery gallery, trusses without tie rods, of 110 metres span, by the eminent engineer De Dion, outvieing our own St. Pancras station, in 1889 the Eiffel Tower, 300 mètres high, and the far famed Forth Bridge. In 1900 steel had become almost the universal material for the frame of structures, even if temporary. But specially to be noticed is that magnificent bridge, the Pont Alexandre III., the metal work of which cost over two and three-quarter million francs. Over 50,000 tons of steel were used in the two Fine Art Palaces alone.

An example from the statistics will show the great economy effected as the result of previous experience, gained in the former exhibitions. In 1878 it cost nearly 5 fr. per cubic metre to erect the steelwork coverings; in 1889 this was reduced to 2·77 fr., while in the recent Exhibition I am assured the figure barely reached 2 fr. per metre cube.

Foundations in Bad Ground.—A singular process was employed in the marshy part of the Exhibition site, where the ground was soft and spongy—that was, mechanical compression, in which a steam pile-driver was first used to perforate the ground down to a hard bottom, then to enlarge the bottom of the hole thus formed, and finally to beat down and consolidate the concrete thrown in to form the foundation, a large concrete pile standing on a kind of mushroomed foot on the hard bottom. This avoided the necessity of removing large masses of poor soil, and gave at the same time a stable substructure for the subsequent erections.

Estimates.—A word on the system of estimates prepared by the architects for the builders. Instead of pricing a bill of quantities, as with us, and the job going to the lowest tenderer, the architect, or his surveyor, gives in his estimate at a given figure. Invitations are then sent out to the contractors, and the game then is to find out who will give the greatest rebate below the already quoted price.

Design.—As regards the buildings collec-

* "Staff" is a variety of fibrous plaster, cast in moulds.

tively, one must regard this Exhibition as a spectacular achievement, an architectural fairy-land; and one can overlook the faults of too exuberant, or fantastic detail, and similar things, bearing in mind that these productions were for a festal occasion, and festive they undoubtedly were, great was the variety of form and mass, extraordinary originality and vitality were displayed in the detail and decorations, while most vigorous was their execution. Picturesqueness was supplied by a row of foreign pavilions on the river bank, the Château d'Eau the gardens of the Trocadero, and other parts of the Exhibition, while dignity was worshipped in the symmetry displayed in the vistas of the Champ de Mars and the Esplanade des Invalides. All this combination was entirely due to the genius of the French artists and their unique methods of training.

Plan, &c.—With the aid of a plan, or rather a map, of that portion of Paris lying on either bank of the Seine from the Pont de la Concorde down to the Pont d'Iéna, and even a little beyond, we find that the Exhibition was laid out on four main sites, two on each bank of the river, with connecting strips bordering immediately on the river itself; but these four sites fall into two groups, each of which consists of a piece of ground on one side of the river connected with another similar plot on the other by means of a bridge, which forms the axis of each group. Thus we have the Champ de Mars—the largest of these four plots—connected with its opposite neighbour, the Trocadero gardens, by the Pont d'Iéna. Similarly we have the Esplanade des Invalides joined to the Champs Elysées portion by the magnificent Pont Alexandre III. Then these two groups are connected themselves by narrow enclosures or strips of ground on the banks of the Seine, as the Rue des Nations on the left bank (the Quai d'Orsay) and the Rue de Paris and Old Paris on the right bank. But the axes of these two groups are inclined to one another, almost meeting on the south side, and diverging to the north, on the large bend made by the river between the two bridges above named.

The area of the site covered is much more than in previous exhibitions, and amounts to 112 hectares, including the overflow site in the forest of Vincennes, allotted to the railway and heavy machinery exhibits.

Description of the Plan.—Champs Elysées Portion.—At the main entrance, overlooking the Place de la Concorde, we find the Porte Monumentale, the principal entrance (of forty-five in all) that gave access to the grounds. This was designed by M. Binet. We pass along a broad walk, parallel to the river, bordered by statues, sculptures, and horticultural exhibits, leading to the magnificent Avenue Nicholas II. and the new bridge, the Pont Alexandre III., and we then find on our right the two Palaces of the Fine Arts, the one nearest to us as we emerge on to the avenue being known as the Petit Palais (although itself an immense structure), and facing it on the other side of the avenue the Grand Palais, the rear of which abuts on to the Avenue d'Antin. These features, the two palaces and the bridge, are intended to be permanent embellishments of the town of Paris. Without staying to describe these fine buildings, we pass along the continuation of the broad walk above referred to, cross the Avenue d'Antin and the Pont des Invalides by a picturesque footbridge, of which you will have a view later, and enter a narrow enclosure between the Cours de la Reine and the river, known as the Rue de Paris, containing chiefly the large pavilion of the town of Paris, by M. Gravigny; the Palace of Horticulture, with its aquarium in the centre; and the Palace of Congress and Social Economy. Each of these structures borders on the river, and on the other side of the Rue de Paris is a miscellaneous crowd of small shows, quite Parisian, such as the Maison du Rire, le Grand Guignol (French Farce), the upside-down house, and so on. Then by another footbridge by the Pont de l'Alma into the picturesque portion known as Old Paris, also bordering on the river, past several bakery exhibits, and emerge on the large garden of the Trocadéro, where are situated the French and foreign colonial exhibits, the eastern portion being allotted to the latter and the western to the French colonies and protectorates. The Palace of the Trocadéro, remaining from the 1878 Exhibition, was not itself a part of the 1900 Exhibition, although included in the site (a portion of the basement and cellars excepted), and at the northern extremity at the rear of the palace a large panorama of Madagascar. From the Palace of the Trocadéro we get our first view over the crowd of buildings forming the Exhibition, looking south to the Champ de Mars, and the plan of the western portion of the site becomes apparent. Before us is the Pont d'Iéna, and opposite us is the Eiffel Tower; beyond it is the Champ de Mars, flanked on either side by a range of palaces, and at the end the vista is closed in by the Château d'Eau and the Palace of Electricity. At the rear of the last-named is the old Galerie des Machines, still standing, and now very much transformed. The terraces of the Champ de Mars, on which stood the Palaces of the Fine and Liberal Arts of the 1889 Exhibition, by M. Formigé, have been demolished.

The Champ de Mars is connected with the Esplanade des Invalides by the Rue des Nations, where we find the most picturesque spectacle of the Exhibition, the row of foreign pavilions abutting on the river, destined to be wiped out of existence by the time I am addressing you, although a few of them are to be re-erected in various parts of the world. On the same bank of the river, before entering the Street of Nations, we pass the Palaces of Forestry, Navigation, and that of the Land and Sea Forces.

Then coming to the Esplanade des Invalides, we find, as on the Champ de Mars, two parallel ranges of buildings, devoted entirely to the decorative and industrial arts, the avenue between these two rows being a continuation of the Avenue Nicholas II. and the Pont Alexandre III., and terminating southwards in the fine vista of the Hôpital des Invalides. It is in this portion of the Exhibition that we find the buildings designed on a high artistic level; the façades are very fine, the masses happily grouped, and the details, if somewhat exuberant, are extremely suitable.

In order to be able to circulate round these vast congeries of buildings, there were two routes, in opposite directions, the electric railway, and the *platforme mobile* (which we shall meet again at the Glasgow Exhibition during the coming summer); then also there were the many lines of penny steamers, several lines of railways, and the ever-present "bath chair."

La Porte Monumentale, designed by M. Binet.—This is a difficult structure to describe without a plan and drawings, but the secret is easily seen and its construction grasped in a view here given, together with the drawings on the walls, the construction being of three large arches on a triangular plan, supporting a large gilded dome. It was well set back from the roadway, and was visible from all sides. An immense archway forms the main entrance, 65 ft. wide, flanked by decorative minarets, 160 ft. high. Behind were other two arches, the whole covering the numerous turnstiles giving access to the grounds, while at the rear was a large wrought-iron gateway, the "Porte des Echevins," reserved for official processions, these all supporting the immense decorated dome. The whole was covered with rich colour, frescoes, and glass mosaics, interspersed with innumerable tinted electric lamps, quite indescribable; while at night one saw charming colour effects produced by the luminous globes, and concealed lights of great power, throwing up the whole into brilliant and overpowering splendour. Its effect to the mind of an architect can only be described as "Arabesque," for its author, who has a passion for colour, was undoubtedly influenced by the art of the Far East.

The crowning feature of this composition was the piquant figure of Modern Paris in the attitude of welcoming the nations, represented by a lady in a rich evening dress and cloak. This figure was the work of M. Moreau-Vauthier, and was the cause of a lengthy and rather hot discussion. The Government decided to remove it, but it remained *in situ* throughout the period of the Exhibition. Then the Ship of State (also the arms of the City of Paris)—a motif in high relief—ornamented the front or spandril portion of the main arch, and at the base of the flanking masses was the original and powerful conception of M. Guillot, a fine bold frieze in bas-relief, the "frise du travail," representing the contribution of Labour to the Exhibition.

An ingenious arrangement of the turnstiles must not be overlooked, calculated to accommodate the passage of over 60,000 persons per hour (see plan lent by the Royal Institute of British Architects). A very careful and exact model was first made, and from this M. Binet produced his final studies.

The whole structure stands on a foundation of piles; the skeleton was a very light construction of iron, overlaid with a framework of wood, and covered with plastic or "staff," then enamelled or painted in colour. Its estimated cost was 20,000*l.*

Recently this was advertised for sale, as old materials. There were 200 tons of iron, 250 cubic mètres of wood, 1,000 of building stone, 150 of brick, 750 of other materials, and 7,500 pieces of glass and lamp globes. In a recent issue of a French professional journal I see the price it fetched was 408*l.*, about 10,200 fr.

Le Grand Palais des Beaux Arts.—This building, on the largest and most monumental scale, was, during the Exhibition, the home of the French and foreign displays of the fine arts, painting, sculpture, and architecture; but it will remain as the permanent home of the French annual Salon, and possibly will also be used as the locale of many Government fêtes and displays. The building is of immense size, covering nearly ten acres; its plan resembles the letter H. The commission for this was given to three architects, who worked together most cordially in its production, and so successfully treated the various portions as to make them appear one great building externally. The front portion, that facing on the Avenue Nicholas II., was entrusted to M. Deglane, who was responsible for the immense façade, and the great hall or "nave" forming the sculpture hall. M. Louvet executed the central portion, forming the link between the front and rear, with the grand staircase, "l'Escalier d'Honneur," for ceremonial use, leading to the concert rooms and picture galleries on the first floor. The rear portion was allotted to M. Albert Thomas, comprising the front facing the Avenue d'Antin, a large central hall, covered by an elliptic dome, and the wings.

The cost of this was estimated at 25,500,000 fr. The foundations, over 550,000 fr., were put in with great difficulty, as a portion of the site was a mere marsh, with beds of peat and clay; part of the palace is therefore constructed on oak piles, and part on concrete bedded on a sandy clay. The stonework, 40,000 French tons, in a brilliant white freestone, the calcaire grossier, was all cut on the site by a diamond saw, fed by a ten ton traveller, running on rails. Stone was exclusively used on the external fronts, but the inner walls were of rubble and brick, faced with stone. Ciment armé, *i.e.*, cement concrete strengthened with steel wire of large gauge, has been largely adopted for the staircases and galleries.

Then for the roof were used about 6,000 tons of steel, executed by Daydé & Pillé, of Creil. I was informed the strains have been so carefully calculated that the resultants pass through the points of support, thus relieving entirely the masonry construction forming the enclosing screen walls of the palace.

Façade.— M. Deglane was obliged to alter and modify his first conception in order that the Petit Palais, facing it, should not be overpowered by its more important neighbour. Instead of one large entrance porch, as originally intended, of great height, we find now three wide bays with doorways and a colonnade; the basement was considerably lowered, and the roof put almost of sight. But the glory of the façade was retained in the glass mosaic frieze, about 250 ft. long, designed by M. Fournier.

The immense nave, or sculpture court, 200 by 55 mètres, is under one great glass roof, the central part being dome shaped, of about 230 ft. diameter, carried on curved principals formed as box girders, grouped in pairs, and decoratively treated with wrought iron scrolls and ornaments.

Centre.—The intermediate part, by M. Louvet, or bridge of the H comprises a return of the *nef*, and the staircase of honour, with two short façades on the north and south sides respectively, each 65 mètres long. M. Louvet had a knotty problem to settle when asked to provide for exhibitions of all sorts; the ground floor being intended for the Concours Hippiques, and equestrian performances; for sculpture and various art exhibitions; the first-floor for picture galleries, and a salon d'honneur, and the basement for stables and stores, while his staircase of honour, besides being the principal means of access to the upper story, was to be the grand decorative feature of the interior. Moreover he had to

arrange this portion as a complete whole, with its own entrances, stairs, lift, and service, so that it could be used for functions quite apart from the Great Hall in the rear block. How he has managed this, only those who have seen and studied carefully the plan, can appreciate.

At the head of the wrought-iron staircase, sumptuously gilded, is the great concert-room, for 1,500 persons.

Rear.—M. Albert Thomas, who did the rear portion of the great palace, had a fine opportunity, and has produced a very fascinating work. It comprises a rectangle of 150 mètres by 45 wide, covering nearly 7,000 square mètres, with an important façade on the Avenue d'Antin, set well back from the frontage, and raised about 4½ mètres above the roadway, giving a well-lighted basement to be utilised as stables during the horse competitions, with room for 600 horses, and accommodating also all the auxiliary services of this vast edifice, such as police, fire and ambulance posts, telephone service, office staff, tobacco bureau, &c.

A large hall, nearly circular, forms the central feature on the ground floor, being about 29 mètres diameter and 34 mètres high, top-lighted, and of great beauty and originality of design; a large gallery, 5·50 mètres wide, running all round the outside, on two floors; and two rectangular halls in the two wings, 20 mètres by 45 mètres, two stories high, containing the means of access to the upper floors, and giving an uninterrupted vista from end to end of the building.

The front to the Avenue is treated with coupled columns, partly detached from the wall, with a central projecting portion forming the second main entrance to the palace, having in front a vast flight of steps. This portion is intended to be used for special exhibitions and functions, independently of the remainder of the palace.

A fine frieze in bas-relief, by M. Joseph Blanc, about 300 ft. long, represents the history of art, and is placed behind the colonnade above mentioned. It has been executed at Sèvres, in opaque pottery or ceramic, and gave a most remarkable effect, being obviously inspired by the Assyrian friezes of Darius.

The Petit Palais, by M. Girault.—This very fine building, to me the gem of the Exhibition, covers a surface of 7,000 square mètres, or nearly 1¾ acres. It is intended, like the grand palace, to be a permanent home for French art, a State museum in fact, and will become the property of the City of Paris, for which the Municipality gave twenty million francs. As part of the Exhibition it contained the retrospective exhibit of French art, such as ivory, bronze, and ceramic work, furniture, jewellery, glass, &c., from the earliest times to the most recent. In construction it should be noted that in this building steel was used to only a limited extent. The walls were all of rubble faced with ashlar, the vaults and floors of brickwork set in gypsum, and the roofs, with a little steel, covered all. I was very much interested, in 1899, when I had the privilege several times of visiting all the works in progress, of seeing how these particular vaults in the Petit Palais were constructed. They were of brick, set in plaster, *i.e.*, the plaster of Paris, which is the universal cementing material, without any centering, only a small curved template being used as a guide; the men worked very rapidly (as plaster sets quickly) in laying the rings or courses of the domes or vaults till the shell was complete; this formed a centre for the next, and even a third, if required, shell on top of this. The cost of this style of work, very light and very strong, was 40 fr. per square mètre; it was very quickly built, and exerted practically no thrust on the walls. The internal stucco decoration was then laid over the surface of the vault as required.

Several developments of the ciment armé were worked out by M. Girault. One corner of the palace was built entirely in cement concrete, with a criss-cross of iron rails bedded in the concrete (38 kilo. the mètre, spaced 0·80 cent.)—whereas, the adjoining walls were on piles in the ordinary way.

Then his floors were largely in ciment armé, details of which can be seen in "La Construction Moderne."

In plan this palace was D-shaped, the interior being a garden surrounded by a semi-circular colonnade, round which was grouped a double range of galleries in a semi-hexagonal form for the exhibits; the straight part of the D formed the façade, the main entrance being in the centre, leading into a fine domed hall off which were two lateral galleries at a slightly higher level, and at the ends or corners, two saloons, from which one enters upon the galleries at rear. Several modifications were made in the design in M. Girault's final drawings, and even during the progress of the works, in order to harmonise with the great palace opposite. The lateral façades were made more ornamental.

In front the chief feature is a semicircular porch, approached by a fine expansive flight of steps, and at the head of this a "gate of honour," with beautifully designed iron gates, gilded. The order employed in the façade is an Ionic one, with lofty bays in the intercolumniations, the shafts being free from the wall, while in the end pavilions the columns repeat the order but are "engaged." Sculpture is used in abundance, the central porch giving us some very fine "motifs."

Internally the decoration is as surprising as the scheme of the exterior, the vaults and domes being covered with relief ornament and sculpture, very fine in treatment and used unsparingly. The columns and pilasters are of a bright and cheerful pink tone.

The loggia surrounding the garden I have already mentioned, but the charm of this portion of the composition cannot be described. One sought this corner gratefully, away from the crowd, with intense relief, and one could study at leisure the work of the master hand who carried off the prize so easily from all his competitors. I refer to the architect M. Girault.

From the further side of the loggia we look back at the inner side of the central pavilion, with the dome and gilded lantern rising above, and the pediment with its gilt bronze figures; the spandrils of the large arch had two fine nude figures in bas-relief.

The Pont Alexandre III.—Time presses, and I must go on with the description of the Pont Alexandre. This, though a purely engineering work, claims our close attention, for were not two of the leading Parisian architects employed to co-operate with the engineers? As M. Lucas so admirably put it when reading his paper before the Royal Institute of British Architects:—"This Pont Alexandre III. will remain an irrefutable witness to the necessity of the alliance between architects and engineers in works of public utility. More than to any structure of our time can we justly apply to it the motto of the Institute—*Usui civium, decori urbium.*"

Can we point to any such example in England, or even in the world? And what is the result? The finest bridge, considered from either the constructive or decorative aspect, that has yet been seen, retaining its monumental character and bearing a great dignity in spite of its festal decorations. The names of its authors I have already given, but will here repeat them, for they are not to be forgotten—MM. Resal and Alby, the engineers, and MM. Cassien-Bernard and Cousin, their architectural collaborators.

The bridge is constructed entirely of steel, 350 ft. in span, in one low sweep, the rise being 6½ metres, composed of fifteen girders (representing the width of the bridge, which is of the noble dimension of 40 mètres), each girder being in two pieces, hinged, or articulated at each abutment and in the centre to allow of the necessary spring (see small print). The roadway had to be kept level, or nearly so, with the approaches, in order that the vista of the Invalides should not be interfered with when seen from the opposite bank. The cost of the metal work used in this bridge was about 2¾ million francs, and the accepted tender for the foundations amounted to over 1¾ million more, 12 per cent. below the engineers' price. The contractors were MM. Letellier and Boutringuien, who had already done the foundations of the Pont Mirabeau (one of the newest bridges in Paris), under the same engineers.

The chief decorative features are the pylons, the statues, the lamp standards, the parapets, and the cartouches. The pylons or monumental piers, 17 mèters high, are two at each end of the bridge, with figures representing—

N. side.—France of the middle ages, by M. Lenoir;
France of to-day, by M. Michel.

S. side.—France of the Renaissance, by M. Coutan;
France of Louis XIV., by M. Marquesta.

On each pylon is a gilt group of Fame and Pegasus, each by a different artist, and designed with great freedom and vigour. Then there are the lion groups on each approach, which can be seen in the views.

The strain on the abutments is about 50 kilogrammes per square centimètre. It took over 7,000 tons of steel, all from the Creusot works (of Long Tom fame), laid from a lattice-framed gangway or temporary bridge, first erected to facilitate the placing the girders in position, and then removed. The abutments are in granite blocks from the Vosges, the only material, perhaps, that would stand the immense strain. The setting out was so carefully done, that on joining up in the centre the discrepancy amounted to $\frac{7}{10}$ of a millimètre on a total length of over 350 ft.

The foundations had to be carried down to a depth of 54 ft. on the right bank, and nearly 60 ft. on the other. Caissons were sunk in the proper positions, and afterwards filled with concrete and granite. Needless to say, compressed air was employed in the subfluvial excavations. Some very massive castings bedded in the abutments receive the ends of the fifteen steel girders, a pin, circular in section, separating the ends of the girders from the cup in the casting to allow of the necessary movement. Each outer girder weighed 167 tons, and the others 144 tons. The platform carrying the roadway is supported by vertical members, connected to the longitudinal girders and then floored over with steel plates riveted down to the substructure, and extending over the quays as well, where a system of masonry arches takes the place of the steel framing of the bridge.

While we have the word bridge in our minds, I may here mention for a casual glance the other bridges of the Exhibition, though they are all merely temporary, and of no importance compared with the magnificent Pont Alexandre III. The one connecting the Palace of the Land and Sea Forces with the Quai de Billy was a light and graceful iron footbridge, or "passerelle," partly in lattice and partly in plate girder work. The footway was suspended from an arch in lattice work springing from masonry piers on each side of the river, the span being 80 mètres between the piers, and the width 8 mètres.

The Pont d'Iena, one of the existing bridges of Paris, was absorbed in the Exhibition site, and effectively disguised by being widened, the footpaths on each side being thrown out over the river on girders supported on cantilevers secured to the masonry piers of the bridge. All this extension work is to be removed, and the bridge restored to its former state.

Two other temporary bridges were built across the river for pedestrians, one close to the Pont de l'Alma, and one to the Pont des Invalides, both on piles, and constructed of timber.

Then, too, we must not overlook the numerous and picturesque footbridges of timber over streets and ways in the Exhibition itself, and which were most artistically treated in what we should call rustic woodwork, with domes in trellis work over, as we see in this view, with a profusion of decorative barndoor fowls symbolising France.

The Palace of Horticulture comes next in order along this bank, designed by M. Charles Gautier. It was constructed wholly of iron and glass, with lateral galleries separated by a central nave, and a rotunda at each end. The framework was of extremely light iron angle-bars; and trellis-work in wood, often in very ornamental forms and groupings, was freely used to conceal the ironwork. The dimensions of this palace were 270 ft. long, 100 ft. wide, and 67 ft. high.

It is proposed to hand over these buildings to the City, to be re-erected, in all probability, at Passy, or to be retained in their present position, if the municipal authorities so choose.

Pavilion of the Town of Paris.—Then we arrive at the dignified pavilion, which the municipality had commissioned the architect, M. Gravigny, to erect—a large and handsome structure, covering more than 5,000 square mètres, constructed entirely of timber, for easy removal. It contained a very important class of exhibits, embracing the various classes of public works undertaken by the municipality, with curiosities and other things of historical interest and value concerning the City. It was planned with a large central court, surrounded with galleries on the first floor, with central

staircases for access to the galleries as the principal feature at each end internally.

Palace of Social Economy, &c.—Passing along, we come to the Palace of Social Economy, or the Palais des Congrès, by M. Mewes. It is about 330 ft. long and 100 ft. wide, and its execution was carried out in a peculiar manner, eight of the best known co-operative industrial associations combining to do the work. It is entirely of timber, covered with "staff," and no steel was used because there happened to be no trade union representing the metal trades. The treatment of the river façade was very broad and simple, standing on piles, and encroaching on the river bed. The bays were divided by broad shallow pilasters. It contained, besides galleries for exhibits, ample and lofty rooms for meetings and congresses of all sorts, and was largely used for such during the whole course of the Exhibition.

Old Paris.—Passing down stream, we come to old Paris, on the same bank, lending itself to the picturesqueness that would otherwise be wanting on that bank of the river. It extended over 750 ft. along the right bank, built almost entirely on piles, and in the hands of M. Robida, who was responsible for its restoration, has given us a delightful conception of a mediæval town. M. Robida was assisted by seven other architects. I will not stop to describe in detail the various buildings there represented, the towers, churches, gateways, and streets, but will refer you to the pictures and other illustrations on the walls. Suffice it to say there were two main "quartiers," that of the Middle Ages and that of the Renaissance. The principal buildings in the Gothic quarter were the Porte St. Michel, the Tour du Louvre, the Rue des Vieilles-Ecoles, the Rue des Remparts, the Church of St. Julien-des-Ménestriers, and the Pillory of St. Germain-des-Près.

In the more modern quarter we found the Châtelet, a fragment of the Palais de la Cité (its celebrated Grand Salle), the external staircase of Sainte Chapelle, the Tour de l'Archevêché, and la foire St. Laurent.

The Champ de Mars.—The plan gives quite clearly the position and extent of the palaces, with their grouping, and we shall glance at the buildings as we pass along the left side round to the right. For these buildings, the four on the flanks and the one at the end, the bill for the iron and steel construction, which was of the most economical materials, came to the little total of 6,000,000 fr.

The terraces, on which stood the Palaces of the Fine and Liberal Arts, by M. Formigé, from the time of the 1889 Exhibition, have been removed, and the inclined plane formed leading up to the Palace of Water and Fire. On our left is the Mining and Metallurgy Palace, by M. Varcollier; next it that of the Textiles, entrusted to M. Blavette; these are balanced by the Civil Engineering and Education Palaces, the former by M. Hermant and the latter by M. Sortais. At the end is the Palace of Mechanical Science, with the grand set piece the Château d'Eau, by M. Paulin, and behind, it, only visible as regards its roof, is the Palace of Electricity, which takes the place of the central dome of the 1889 Exhibition.

The area of the Champ de Mars thus covered is more than sixty acres, and one can hardly realise the vast extent of the buildings and grounds until the dimensions are given in detail, as you will hear presently. At one time the Commission entertained the tempting idea of covering the whole of this space with one large roof, to mark the progress of steel construction, but funds and time did not allow of this scheme being thrashed out. Perhaps we shall even have this monstrosity in the Exhibition of 1911, when the next international display falls due, and probably lighter and stiffer metals will then be in common use. Indeed, we hardly know where the triumphs of electricity are leading us.

The Palace of Mines and Metallurgy. By M. Varcollier, architect.—This is a well-designed building, facing on the central avenue for an extent of 315 ft., and on the return front, parallel to the river, of 250 ft. At the angle where the two fronts join is the entrance, surmounted by a lofty dome, flanked by pavilions, containing each a circular staircase for access to the broad open gallery or loggia on the first floor. The steel framework is covered with wood, over which is the usual wire lathing and plaster painted in a happy scheme of polychrome decoration.

The entrance portion is very striking—striking in more than one sense—for over the porch is a little carillon tower containing a fine peal of bells, which gave much entertainment to the crowds that assembled to hear the performances.

The interior was a vast place, of light ironwork, and the exhibits were so treated to lend themselves to the decoration of the avenues. It was a great surprise to see how such an intractable material, in the hands of the manufacturers, could be made to follow the most pleasing lines and groupings at will, affording a glimpse of the time when swords shall be beaten into ploughshares, for here were firearms and weapons of offence undergoing all sorts of contortions to present a decorative display.

The Palace of Textiles, the shortened form of the official name, the Palace of Yarns, Cottons, and Vestments, was still larger than the last, being 923 ft. long by 424 ft. wide—by no means a small building. It was undertaken by M. Blavette. It had similar conditions imposed on it as the others of this group, *e.g.*, a broad open arcade on the avenue front, the first story being about 23 ft. from the ground.

The large entrance porch was very dignified, and treated, as were nearly all the buildings on the Champ de Mars, with a polychrome scheme in very good taste. The effect at night, too, was very happy. It should be said that this entrance, as well as the one opposite to it, was used to accommodate traffic in the evenings, when the galleries and exhibits were closed to the public.

From the drawings you will gather much more information than I can stay to give.

This view shows the angle pavilion, where the frontage line sets forward, and illustrates the external staircase for access to the loggia on the first floor.

At the end of the Champ de Mars we have the two palaces, or rather one palace in two halves, devoted to Mechanical Science and to Chemical Industries, with the masterpiece of M. Paulin in between, the Château d'Eau, closing the vista at the southern end. These two palaces I am now describing are connected at the rear of the grand cascade by a broad corridor at the first-floor level (you must not forget the inclined plane I mentioned just now). In plan, each half palace consists of three wide halls separated by narrower galleries. Each building is almost square, being about 456 ft. by 453 ft., with an external arcade, details of which you will see on one of the screens, and are worth your close attention.

Now for the Château d'Eau, M. Paulin's chef-d'œuvre, placed in front of the Palais de l'Electricité. It was built on rubble piers, at the head of the immense slope where the fountains and basins were laid out. Its principal feature was the vast architectural niche, 24 mètres in diameter, from the head of which issued the water, the fall and jets being arranged in a very artistic and original manner. Most of this water was pumped from the Seine and was for the use of the boilers and condensers at work close by, as you will presently hear. Some charming sculpture and statuary groups, with fantastic and impossible monsters were scattered about, and the fountain jets added to the picturesque grouping and happy disposition of the architectural features of this remarkable piece of work.

But it was at night that one felt the indescribable charm, when lighted up by its thousands of lamps in ever changing harmonies of colour, and one carried away a never-to-be-forgotten picture of this fairy-like grotto that scarcely seemed the work of human hands.

Palace of Electricity. By M. Hénard.—This was at the rear of, and masked by, the Château d'Eau, therefore the architect raised the roof of the gallery and threw all his inventive genius into the skyline he thus formed, a broad open cresting of metal and glass, like lacework by day, and suggestive of a fairy embroidery by night, with its changing lights. In the centre was a figure symbolic of electricity, borne on a car, drawn by two symmetrical animals, a Pegasus for the poetry of science, and a dragon for its material power, backed by a metal sun 40 ft. diameter, placed at a height of 66 mètres, nearly as high as the towers of Notre Dame. The palace measures about 230 ft. high, and its front extends the whole width of the Champ de Mars avenue, 150 mètres long. Its construction was entirely of iron and glass.

It was owing to the enormous machinery power for driving the dynamos, &c., in this building that the vast quantity of water—72,000 litres per minute—was required; this complicated the problem, and resulted in the Château d'Eau being emphasised at the expense of the Palace of Electricity.

M. Henard had also another delightful work in hand, the Hall of Illusions; two drawings on the walls describe this by a plan and a view of the interior. The astounding effects of changing colour and infinite space that one can scarcely describe were produced by large mirrors and coloured lights.

The Palace of Civil Engineering, by M. Hermant, is the counterpart, as regards size and disposition, of the Palace of Textiles, which it faces. The entrance porch, of which you see a view, with further details on the walls, is 27 mètres wide; on each side of this is the usual open arcade and gallery, over which is a fine frieze, 2¾ mètres high, in an appropriate architectural setting, representing the various means of transport, by M. Allard. The detail gives an idea of it.

Instead of the ordinary iron lathing or wire netting we usually find as the foundation of the decorative plaster work the contractors here used flat sheets of metal punched or stamped out into tongues, which projecting formed the key for the plaster.

The Palace of Education, M. Sortais, architect.—This palace, covering over 27,000 square mètres, is similar in its general lines to its fellow opposite, the Palace of Mines, first described. Its angle pavilion is very charming, best illustrated by the drawings, with the delightful campanile of about 150 ft. high.

The steel construction of this and the last described building (Civil Engineering) was exceedingly economical, being built up entirely of small sections, which meant easy handling, quickness and facility of construction, and cheapness of execution. We again find the open gallery or loggia which was imposed on the architects of the neighbouring buildings.

The Salle des Fêtes, by M. Raulin, was one of the attractions of the Exhibition, and is destined, I trust, to remain for some time to come, although its fate is not yet settled. It must be remembered that the old Machinery Gallery of the 1889 Exhibition remained standing, and was absorbed into the 1900 one, but the centre portion of this was screened off, forming a square in plan (although the impression to the spectator is a circular plan) and will accommodate 20,000 to 25,000 people. Its dimensions are 535 ft. by 460 ft. on plan. The dome is 300 ft. diameter, and is 147 ft. from the floor.

It may be that by now it is decided to remove the whole of the old Machinery Gallery, including the Salle des Fêtes, in order that the façade of the École Militaire may be shown more adequately, as intended by its architect Gabriel. This scheme is favoured by M. Bouvard, Architect to the city of Paris, who wishes to turn the Champ de Mars into a fine public park, but the public and the Press are very much against it.

Two artistic façades form the screens which divide the hall from the two ends of the Machinery Gallery. Models and studies were made for this hall to a large scale, allowing all the details to be seen and worked out, leaving nothing to remain to be executed at haphazard. The result was something charming. The coloured glass dome was most happy in its effect, not vulgar, but very soft, the ceiling paintings and reliefs were things deserving of a permanent shrine, and the ironwork supporting the dome and roof was most graceful. The study of this charming interior would well repay a careful student. Unfortunately, I could obtain no slides to adequately show the effect of the interior, but on the walls are some details of the decorative work in painting and modelling. The four great panels were by M. François Flameng, M. Rochegrosse, M. Maignan, and M. Cormon.

Before leaving the Champ de Mars there are a few little buildings at which we might glance, to see the festal character of the pavilions erected for the purposes of the shows and attractions. The Luminous Palace, the creation of M. Ponsin, carried out by M. Latapy, on a special site near the Eiffel Tower. Glass formed almost the entire material of the structure, and at night the whole was illuminated, walls, columns and all, by electric lights skilfully concealed, and arranged to change the colours at will.

The next is the Women's Palace, for the exhibits connected with the fair sex, and is a type of the temporary structures I am speaking

of. It shows the French are not afraid to spend both brains and money on merely ephemeral buildings, and to do their utmost to carry out our own motto, "Design with beauty."

Next we have the Pavilion of Ecuador, at the foot of the Eiffel Tower, which is rather more flamboyant than the last.

Lastly the Café de la Belle Meunière, known perhaps to some of you who are fond of interiors.

Turning our attention to the buildings on the left bank of the river, beginning at the west end and proceeding up stream, we see first the Globe Celeste, the most unfortunate of the private speculations of the exhibitions. Undoubtedly most valuable from an educational point of view, and certainly bearing a charm of its own with the architectural character of the base and setting, this side show suffered by the alarming accident that happened in the early days of the Exhibition, when the bridge leading to it from the Champ de Mars fell down during the process of striking the centering, and the show was at once closed by the authorities.

Then we come to the Palace of Forests (with Sport generally), over 600 ft. long on its river front, constructed entirely of wood, and decorated with the various forestry exhibits and ornamental timbers. It was designed by MM. Tronchet and Rey, who were also entrusted with the neighbouring Palace of Navigation. This was also on the river front, beyond the Pont d'Iéna, with a façade of 480 ft. long. This also was a timber structure, built in a fashion similar to our steel construction, and covered with "staff," the decorative details being most charming, suggested by ships and their trimmings, and affording materials for many hours' sketching.

After this is the Creusot Pavilion, the exhibit of the great firm of Schneider, who carried out the steel work of the Pont Alexandre III., a huge domed pavilion, painted in red oxide. Why this hideous structure, out of scale and colour with its surroundings, was allowed to be planted down on the river bank, and spoil the otherwise picturesque view, I cannot conceive. It should have been relegated to a back site. Its construction was very interesting, in spite of its ugly appearance, and well repaid study, but its position was unhappily selected. The diameter of the dome was 140 ft. and in height it was 165 internally; this was covered with a lantern or belfry. The framing of the dome was of twenty-four curved plate girders, connected at intervals horizontally by box girders, the lower ends of the ribs resting on steel roller bearings.

The dome itself is of cement slabs on a wood sheathing, although the colour it was painted was the contractor's usual coat of red oxide of iron, that suggested iron wholly in its construction, and deceived one so much that one began to hunt for the rivets that were not there. The entire weight of the lantern and dome was some 400 tons.

Another constructional point to be studied was the system of covering the railway cutting which ran under a portion of the site.

Within was one of the famous Long Tom guns, on a revolving stage.

Then we pass on to the Army and Navy Palace, or, to be correct, the Palace of the Land and Sea Forces, an immense building, bordering on the river, for more than 340 ft. in length, designed in a style more or less mediæval. It was built of wooden framing, trussed up with iron tie rods and bolts, and the plaster covering was attached in slabs nailed to the timbers, then an external finishing coat, and the decorations were laid on this.

Next came the Palace of Hygiene, of which I have no illustrations or drawings.

After that the Pavilion of Mexico, one of the streets of foreign nations that I shall presently deal with.

Passing on and crossing the end of the Pont de l'Alma, by another of those picturesque footbridges already mentioned, we enter the Street of Nations, which for the moment I will pass over, and come to the remainder of the Exhibition buildings on the Esplanade des Invalides, returning afterwards to complete our tour of the Exhibition by the Rue des Nations.

In order to preserve the vista ending in the dome of the Invalides, for which the Avenue Nicholas II. and the Pont Alexandre III. were designed, M. Picard, the Commissioner, arranged the palaces of the diverse industries on each side of the continuation avenue. Two half palaces at each end and two others in the centre form the group that borders on the east and west sides of the Esplanade des Invalides, all too narrow in width, I may remark. Looking towards the dome, the buildings on the left were reserved for French work, and those on the right for the various foreign nations. All are of the lightest possible construction consistent with safety. Their contents were the exhibits of those industries that minister to luxury and to the surroundings of our public and private life.

The two palaces facing the quay are those of the National Manufactures, with curved porticoes, the work of MM. Toudoire and Pradelle. The slides and drawings will give all the details, and illustrate more fully than my description the richly decorated architecture. In extent these cover a surface of 12,000 square mètres. In the large wall surfaces and panels are fine allegorical frescoes by such eminent men as Paul Buffet, Vauthier, Chabas, and so on.

Of the two centre palaces, that on the left looking south, is by M. Esquie, and is balanced on the right by one similar in extent, and following the general lines, by MM. Larche and Nachon, the delightful details of the latter being suggested and based on the French flora, and reflecting great credit for their freedom and vigour on the designers and sculptors.

These palaces are to shelter the exhibits of the various industries connected with our homes, such as decorative furniture, window glass work, goldsmiths' work and jewellery, bronze and iron work, and so on.

Unfortunately, I have no slides to show either of these in a proper manner, but on the screens are several good drawings and photos of both palaces.

The next four slides give some of the details of the forms taken by the decorations, based on the flora of the country:—A campanile, capitals of the first-floor arcade, an angle cartouche, and keystones of the arches. These show the originality brought to bear on the temporary works of this portion of the Exhibition.

At the south end of the esplanade are two half palaces by M. Tropey-Bailly (for ceramic work, which showed up very strong in this Exhibition, and for glass work), with the wonderful Invalides front, on the Rue de Grenelle. This elevation consists of two symmetrical facades, with an exceedingly well treated frieze in bas-relief representing the Decorative Arts and Labour. Notice must also be taken of the graceful pinnacles in white and gold, and of the two pavilions immediately inside the entrance, with the semi-circular hollowed fronts forming a charming little circus. The grouping, and, in fact, the general arrangement and treatment of M. Tropey-Bailly's work is most happy.

In front of the half pavilion here shown stood a remarkable exhibit of Sèvres ceramic ware, the fountain, which may be seen in some of the views. This is destined to stand in the Champs Elysées after that thoroughfare has recovered from the upheaval caused by the Exhibition works.

The portico, too, also in Sèvres ware, which also stood in the Esplanade des Invalides, is destined to be re-erected in the Square of St. Germain-des-Près, or its immediate neighbourhood.

The Street of Nations.—This I will describe in the reverse order to the way we have travelled. The more important buildings are near the Pont des Invalides, where the Rue des Nations commences.

Italy has on the Quai d'Orsay the largest and most imposing of all the foreign pavilions, a florid building in fifteenth century style, consisting of a cathedral-like structure, with suggestion of Venice, Florence, and Pavia. This has a central dome with four angle cupolas, all gilt. The windows, which are very large, are filled with tracery.

The interior is very imposing, but suffered by the crowds of stalls for the sale of so-called works of art and small mementoes, destroying the dignity of effect that otherwise would have had an effective charm to a person who could be left alone to enjoy it, but the pity was you could not be left alone. The architects were MM. Carle Coppi and Salvadori.

Turkey.—Of this I have unfortunately no slide, so must refer you to the long panorama on the wall and the photos on the screens. The Ottoman Pavilion is more modest than the Italian and has more reserve, and the work was entrusted to a French architect, M. Dubuisson, who has suggested one of the innumerable mosques of Stamboul.

United States.—A bold and dignified building, with a great porch on the river front, forming the background to the equestrian statue of George Washington. The building is simply planned, and effect is produced by the lavish use of statues, groups, and the omnipresent American eagle. Other features to notice were the well-lighted interior, the bold staircases, the number of lifts, and the colour decorations. The architects were MM. Coolidge and Morin-Goustiaux.

Austria.—The architect was M. Baumann, who has produced a pleasing exterior suggestive of the Louis XVI. style, but partaking of the nature of a hunting-lodge ornamented with grotesque heads, festoons, and garlands.

Bosnia.—Nothing is worth particular mention in this building except that the wooden eaves are very bold and the corbelled-out balconies are suggestive of Turkish work. The architect was M. Panek, who adopted rather a rural style for his composition. Its scheme of decoration was in blue and white. The tower represented a kouba, or old Bosnian dungeon.

Hungary.—This was rather a medley of styles, embodying nearly all that had existed since the foundation of the Magyar State. MM. Zoltan-Balint and Jambor, of Buda-Pesth, were the architects. The south side, on the Quai d'Orsay, was Romanesque; the north, or river front, was Gothic; the tower was a reproduction of a church tower with an unpronounceable name, and the doorways were also exact reproductions from other churches. The Salle des Hussards (see view) was a notable feature of the interior, with an original decoration.

The British Pavilion, very small beside some of its neighbours, and of which I could not anywhere obtain a slide. It was intended by the British Commission to make this the special show of our native construction and decoration, and the plan decided on was to reproduce an old English manor-house. Mr. Lutyens was entrusted with the commission, and he has given us in the north front a replica of that of Kingston House, near Bath, the other façades being adapted from contemporary buildings.

Its construction was entirely of steel framework, for easy and future removal, for which Sir B. Baker was responsible. Various well-known firms undertook the decoration and furnishing of the interior. The City of Bath sent the pieces of Elizabethan work in the Library; the great gallery was adapted from the Cartoon Gallery at Knole, near Sevenoaks.

It would be impossible to name in detail all the firms who have contributed, but I must here thank Mr. Geo. Wragge for the loan of some photos and a cartoon of his stained-glass windows in the dining-room. These are on the walls and may be seen afterwards.

This has been dismantled, and possibly at the present moment has been entirely removed.

Belgium.—On the other side of an open space, on which abuts the British Pavilion, is the Pavilion of Belgium, an exact reproduction of the Town Hall of Oudenarde, with all its florid Gothic detail and profusion of carving. This was entrusted to MM Acker and Mankels, who preferred to present to us the masterpiece of Flemish work in the sixteenth century (1525-1530). Now destroyed.

Norway has arranged a pavilion distinct from Sweden, and the commission was entrusted to M. Sinding-Larsen. Its style was peculiar, and it was entirely constructed of wood, lavishly coloured.

Germany, which comes next, has quite a festal appearance, with its elaborately-coloured walls and exuberant detail. Inside there was a fine rich staircase, wall paintings everywhere.

Spain.—Next to it, in this view, is the Pavilion of Spain, the work of M. Urioste y Velada, who has suggested the Sevillian type of architecture, the details being taken from various well-known buildings of the Renaissance. It was planned round a central courtyard or cortile, formed with colonnades and balustrades, one lofty tower and others more modest. The whole was very dignified in effect.

The pavilion has been recently destroyed, fetching about 1,000*l.*

Monaco.—Next we see the Pavilion of Monaco, the little principality that has made a big show. In this view, before we leave it, I will point out

also the Pavilion of Sweden. Monaco has presented us with an Italian type of architecture, and a fine tower suggestive of the Palazzo Vecchio in an imitation granite.

On the return front is a double loggia, the vault of the upper one being decorated in a scheme of blue.

Sweden.—An extraordinary building, which I confess I am unable to describe to you. But the wall picture will sufficiently illustrate anything you may wish to use up in your next competition. M. Boberg was the architect.

Greece comes next, the production of M. Magne, architect, in the Byzantine style, a brick (or imitation brick) building with a stilted cupola covered with red tiles.

Servia, almost the last of the range before we reach the Pont de l'Alma, affects a florid type of Byzantine, an octagon dome over the centre, and external arcades rather highly coloured. Small cupolas cover the angles. M. Baudry was the designer.

It is at present uncertain if any of these foreign pavilions will be preserved, for the matter is still under discussion. Several schemes are yet in the air, but in all probability the whole, or the majority, of them will be removed.

The Chairman, in inviting discussion, said they must all have been greatly struck by the excellent way Mr. Wonnacott had made use of his time in Paris, and the interesting manner in which he put before them the knowledge he had acquired. The way in which Mr. Wonnacott had dealt with the inception of this great Exhibition and then of the organisation by which it was brought about and the construction, science, and art shown in it, would be of great value to all of them, and he congratulated Mr. Wonnacott on his effort to carry out the spirit of the prize, which he won in competition with several other candidates.

Mr. C. H. Brodie briefly proposed a hearty vote of thanks to Mr. Wonnacott for his paper and for bringing before them such a splendid collection of drawings and lantern slides.

Mr. Bamford Slack said he seconded the vote of thanks with considerable pleasure. In the course of a ten days' visit to Paris last year he had endeavoured to see the fringe of the Exhibition, but he had found it impossible to look more than into the corners of it. He was not an architect, and the features which struck him as the most interesting were not necessarily the architectural beauties of the Exhibition, though wherever one looked one could not fail to be struck by the beauty of many of the buildings. The fact which struck him, as a layman, most was that although the buildings were of such enormous size, they were so beautifully proportioned that one did not dwarf the other. In the case of the Grand Palais, it did not dwarf the Petit Palais, which was so closely opposite to it, and one did not realise its massiveness, so well was it proportioned. Looking at the Exhibition, quite apart from the architectural point of view, there were five features which pleased him most, viz.—the British Pavilion, with its exhibits of all that was best in British art; the Petit Palais, which was crammed full of the art treasures of France; the Grand Palais; the tapestries in the Spanish Pavilion; and the German collection of French pictures made by Frederick the Great. The Château d'Eau was exceedingly beautiful at night. But, to his mind, the most wonderful thing in all Paris—in all Europe—was "that wretched thing," as the lecturer had called it, the Eiffel Tower, which he always regarded as the greatest triumph of the skill of man that Paris could show. He said that at the risk of shocking the feelings of architects; but he could not help feeling that the Eiffel Tower was a wonderful monument of what man could do with a few bars and rivets of steel.

The Chairman, in putting the vote of thanks to the meeting, said that one result of Mr. Wonnacott's paper was to show them the state of art in France at the beginning of the new century. It showed how insensibly the functions of the architect were being changed by the architect being placed in co-operation with the engineer, and it showed how essential to the training of an architect was some knowledge of science and scientific construction, as well as the principles of art. No doubt that tendency would become more pronounced, and though the functions of architects and engineers were in a way separate, yet it was most desirable that the members of those two professions should understand better the work of one another, and he hoped before long English architects and engineers would work more in alliance than they had done in the past and were doing now. At the present time the importance of this did not seem to be realised, and it would be impossible under the present order of things to produce in London a bridge like the New Alexander III. bridge in Paris—not only because we had not the same art feeling that the French had, but because the public had no notion of the absolute importance and necessity of an alliance of an architect or architects with an engineer in the production of a monumental structure like a bridge over the Thames.

The vote of thanks having been heartily agreed to,

Mr. Wonnacott said he had only read a portion of the report which, in fulfilment of the conditions imposed on him, he would submit to the Association. He should like them to include in the vote of thanks the name of Mr. Lutyens for his kindness in lending for the occasion his drawings of the British Pavilion, to Mr. Geo. Wragge for his kindness in sending one of the stained-glass lights, and to the Royal Institute of British Architects for lending him several of M. Charles Lucas's collection of drawings of the Exhibition.

The Chairman announced that the next meeting, after the special general meeting previously referred to, would be held on March 15 when Mr. H. B. Measures would read a paper on "Rowton Houses."

The meeting then terminated.

THE SURVEYORS' INSTITUTION.

THE following is the remainder of Mr. Thomas Blashill's paper on "The Present Condition of the Building Industry," which was read before the Surveyors' Institution, Great George-street, on the 25th ult., and the first part of which was printed in our last issue:—

"The trades-union is a natural engine for accomplishing what the isolated craftsman cannot bring about for himself. If it had been instituted in these days when every section of commercial and professional life, however small, has its society to look after its interests, nobody would have given the matter a thought. If its methods differ from societies of another class, it is because the wants of its members are different and must be differently met. From a perusal of the rules, kindly given to me, of some important trade societies, I fail to see anything to which reasonable objection can be taken by an impartial person. Apart from unemployed and sick benefit and the preservation of internal harmony, their object is the protection of the trade rights and the privileges of the members. They go beyond the rules of our professional societies in certain matters, as in the limitation of the age at which a person may enter the trade, but that can only apply to their own members, and if we should think such a policy advisable we could do the like. If they prescribe the lowest rates at which their members may work, so might we. The constitution and proceedings of branch societies are very strictly regulated. It may be that those proceedings are with equal strictness supervised, though I do not see how this is done. But as the union must to a large extent be responsible for the conduct of its branches, that is a point of some importance, and I shall have more to say upon it. So far as the union is concerned we may look upon it as the thinking soul of a body every particle of which is supposed to contribute to the process.

With the regulation of wages and hours of labour, important as such details may seem, I shall not concern myself. These are regulated, not on any fixed principle, but with reference to time and place and circumstances, and so are many other trade regulations, and though these must not be overlooked, they are dwarfed by comparison with the great principle at the bottom of disputes between capital and labour. To put the matter in a nutshell, it is the prevention of "sweating" and the improvement of the position of craftsmen as a whole. In this consideration questions between payment by time and payment by results play a leading part. Not that, in the eyes of the workman, there is anything specially sacred in either alternative. There are now far more workmen, trade unionists, paid by the piece than are paid by time, and the principle of payment by the piece is as stubbornly fought for in certain trades as is payment by time in others. The question is by which system the dangerous and abhorrent practice of "sweating" can most effectively be prevented. If a man is working with a machine that can be driven at an increased speed, at the will of the employer he can be made to turn out an ever-increasing quantity of work while his wages may remain the same. That is day-work "sweating," and in such a case it is only through payment by the piece that the machine hand can get a fair return for his increased labour. But if men are working by the piece at a pace regulated only by their own strength or energy, the man who is the strongest and the quickest will earn the most, and the employers may lower their rate of pay not only to him, but to the workmen all round. This is piecework "sweating" combined with individual bargaining, and the building industry is one of those in which from bitter experience it is resisted with might and main.

I am not quite sure that sweating is inevitable with piecework, but before discussing that matter we will try to see what day work really is, the fair day's work for which a fair day's wage is the equivalent.

The late Baroness de Bunsen, the daughter of a very capable mother, tells how that mother when placing some additional household duty upon her would say, "It is all in your day's work." She adds, "That idea of a *day's work*, as much as one's strength can perform and no more, but not less, and limited to a term, the day, was always fully satisfactory to me, and it is equally satisfactory now." That is the notion of the energetic house-mother who, so long as she is awake, must always be doing something for her home and family. It also describes the habit of the energetic man who is working for himself. But if such a task were put on the shoulders of men in a free country, paid by the day or hour, it would not be borne.

It would bring us back to the fourteenth century, and the struggles of the bondmen, who thereby, and by many a struggle since, have reduced the day's work within bounds more reasonable, if less easily defined. The day's work, even in the eyes of the employer, is not a day of exhaustive toil. Perhaps it may, at the highest, be defined as so much work within fixed hours as can be done by the ordinary workman comfortably—that is, without injury to his health and without diminishing his capacity for enjoying the rest of the day as he may think fit. I put it as high as this because the day's work is a valuable commodity which he has to sell, and if he unduly diminishes it he must in the long run be the loser. But, in practice, the day's work will be so much work as the workman and the employer with this knowledge before them are fairly contented to give and to accept at the date and under all the circumstances. There must be security against sweating, but if the workman puts in much less than this he runs the risk of outside competition, encourages the employer to look out for cheaper ways of getting the work done, or even diminishes his desire to have it done at all. I know it has been said that labour is not a commodity in the ordinary sense; but "labour" is often confused with "time" with mischievous results. Not workmen only, but the rest of us, get into a habit of talking about our "time" as if it were something valuable by which money ought to be made. But mere time is worthless to any one except the owner, perhaps to him. No employer would think of paying for it. We are confusing the means by which a thing is measured with the thing itself. This notion of payment for time seems to be at the bottom of the aversion which some thinkers on the labour question feel to treating labour as a commodity to be dealt in by purchase and sale. It would no doubt be a hateful thing to buy and pay for so much of a man as his necessity forced him to sell. What the employer really buys is so much improvement to the material which he puts before the workman as may reasonably be expected to be done in the time by which the payment is calculated. This is simply measurement by the town clock instead of by the 5-ft. rod, and if a day's work were a fixed quantity the clock would measure it as accurately and much more conveniently than any scale of feet and inches. So long as clock measurement is fairly used by both parties, without hurrying or chasing on the one hand and without loitering on the other, its record should be fairly satisfactory. But if we look

at the matter honestly or guilefully, it is impossible to get out of the fact that directly you interfere with the rate of work, payment by time becomes piecework under another name. Not only from what I have said, but from a study of the disputes which often arise over the day's work is this evident. When we come to the question of loitering I will give two or three illustrations of this.

The desire to have an easy life is common amongst time-workers of every class. A great modern novelist found subjects for his satire among gentlemen engaged in the public service, and one has heard of conspicuous instances in real life. In fact, short hours and light work seem to have been traditional in times past in certain offices. A few weeks ago there died a very aged gentleman who could recall the time when his office hours were from eleven to two, while the holidays were just as exemplary. If a workman is merely idle, he is only like many more of us who prefer an easy time. An employer must recognise that, and take his chance of being recouped by extra energy in some other quarter. But when men are working together so that all must go at the same pace, the pace will be that of the weakest, the least energetic, and the slowest. In such a case health and strength and briskness go for nothing, and to the employer it may be just the same as if his whole staff on that particular work had been recruited from the class to which the feeblest among them belongs. A judicious employer will therefore select his slowest hand with some care.

There is, however, a far more serious matter than mere idleness. It is the deliberate loitering of which employers have long complained, the effect of which is to prolong the job so as to delay the day when the men will have to be paid off, or so as to keep the work longer in hand for the benefit of workmen in general. I am disposed to put down the few bad cases that came under my notice to natural idleness with lax supervision; but this is not the view taken by such employers as have dealt with the subject. The reading of a paper by Mr. Brassey, now Lord Brassey, at the Royal Institute of British Architects in 1878 brought out much evidence on this subject. Messrs. Lucas had found that labour on brickwork which had been estimated on previous experience to cost *2l.* 17s. 0d. or *3l.* 3s. 0d. per rod actually cost *5l.* They found that although they had provided machinery which should have made up for the recent rise in wages, the cost of building had actually increased by 20 to 30 per cent., the cost of materials remaining practically unaltered. This, they say, was entirely due to the small amount of work done by the men. They found, in fact, that men did little more than half the work for ninepence per hour than they formerly did for sixpence. Mr. Lucas said that the unions forbid piecework, with the object of obtaining 'the largest amount of pay for the smallest amount of work in the least number of working hours,' so that the "public are hit all round."

One or two archifects were shocked because this statement as to work and pay and hours was defended by a trades-union speaker, though I think he had only meant to embody the desire that most of us have to sell our services at a higher rate. But the professional man, whether he may be paid by time or by the piece, manages the matter by raising his charges if he can, while he either goes on giving the same service, or even making it more or better. Wages, like fees, may rise or may fall, but I think we shall be of opinion that the service, if it is not excessive, should remain at least the same. We will make a note of what was said about "the public," to whom I have not yet alluded.

The view of contractors in general on this point may be gathered from a list of lowest tenders extending from 1889 to 1898, in which stock brickwork rose from *11l.* per rod to *20l.* and even to *22l.*; a rise of 100 per cent. But no item in the cost of brickwork had risen very seriously except bricks, which had gone up 30 per cent. Bricklayers' wages had risen only 10 per cent., and the explanation given by contractors was that the men did less work. Contractors have been saying recently what was said twenty-three years ago, "It is impossible to calculate beforehand the cost of labour." Contrast his with the labour on the rapid construction of America, where, as the *Times* correspondent says, the engineer watches his machine even during his meals, and where an English traveller has recently reported that every one saves time and does his best for his employer. For all this there must be a reason.

I have quoted enough to show what employers have publicly stated as to loitering and what their tenders prove. One instance was given to show that it was systematic. Some Gothic capitals, for which *5l.* each had been provided, were given to the men, and the first one cost that sum or less, but the others cost *8l.* each. It was explained that the shop steward had said that they were worth this sum, and they must be made to come to it. Many similar cases have come to me at first hand. A foreman set a new hand to do some piece of joinery which he considered would be finished well within the day. After an hour or two he noticed that there was practically no progress, and, on remonstrating, the man replied, 'This job is a day and a half;' so they parted, and it was done in half a day. This is fixing the quantity of work to be done for a day's pay, and is really piecework disguised as daywork, and it points to a system well enough understood to be acted on by the individual workman without the help of a shop steward.

Another instance carries the matter much further. A foreman on seriously discussing with the leading hand or perhaps the shop steward, on a job, the delay plainly evident, was told that the amount of the contract for the particular work was so much, there had been three-fourths done, and the cost had only been so much; there was, therefore, no occasion to complain as yet. Upon that view this was not merely piecework, it was partnership—a limited firm in which one partner took so much as he considered to be reasonable, leaving the other, who had no voice, just so much as ought to be left for him. The mischief of this reaches further. If this division of the profits were frankly understood the men might finish off the work at their own pace, and take their share. But being on daywork they can only take it out in hours, and however the employer or the public may suffer by the delay, delay there must be. The sagacity of the plumbers of Chicago has shown them a more excellent way. They fix what they consider their day's work of seven hours, do it in five or six hours, and take their full day's pay. Surely this is piecework pure and simple!

In the discussion of 1878 a labour leader met all statements as to loitering by laying the blame on incompetent foremen. He said a foreman should know how much work a man ought to do. So he should, no doubt; but the foreman's story is that it is useless to attempt to get more work even by turning off men when the new hands do only the same as the old. My own impression is that this is scarcely true. A foreman is of real use when he is good-natured and firm, and has at his back an employer of good position, but who may be depended on to shut up the work when he feels he is being badly used. I think this is the reason why certain employers of high standing can get work done cheaper than some others.

There are many things charged against workmen besides loitering. Some of them, though very troublesome to the employer, have grown out of a reasonable anxiety to prevent disputes among their fellows in other trades; others appear to be the fag-ends of old trade customs; others arise out of the splitting up of a trade into branches, which, under certain circumstances, has its convenience, but they may be mere substitutes for loitering. There are also impediments of progress in work caused by a genuine anxiety to keep their trade free from intruders—at the expense of the employer. And in certain trades there is grave obstruction caused by a bigoted adherence to a rule against overtime, even when an emergency occurs that demands some trivial relaxation.

The demand for skill of various kinds, the diversity of materials and the necessity for different tools, must naturally have suggested the division of the building industry into separate crafts. The principle is good if not carried too far. Work in stone differs radically from work in wood. Carpenters differ just enough from joiners to justify division so long as convenient. "Three-branch" hands may flourish where work is scarce and lies wide, but they become one-branch in busy towns. Workers in brass and zinc and tin and iron may be divided so rigorously that an article passes through half-a-dozen hands when it might be finished by one or two. When it took ten men to make a pin I suspect that about five of them were practically lookers-on, till the machine produced a revolution that swallowed up not the five only but the ten. That is a melancholy but common story.

What is convenient when you are manufacturing by the gross may be folly when a single article is in question or in case of an emergency. If there is to be no elasticity, a bricklayer, however handy he may be with his trowel, could not stop a rat-hole in a plastered wall. The frequent disputes amongst bricklayers and plasterers and tilers that engage the attention of unions, arbitrators, and the Labour Department of the Board of Trade may lend interest to life, but these battles should not be fought at the expense of the employer or ultimately of the client.

By all accounts the plasterer gives more trouble by his trade regulations than any other craftsman. He claims work that other workmen think to be theirs, and he insists on doing his own work in an expensive way. In an important provincial town, after a strike over the allotment of some work to floors between plasterers and bricklayers, an agreement was come to, and after further delay, through disorganisation, the work recommenced. Then the plasterers objected because the labourers wheeled the plaster or mortar in on a barrow instead of carrying it on a head-board; they objected again because the labourers mixed plaster for cornices on a board with a trowel, and so it had to be mixed in a bucket and stirred with a stick. In a building some little cement work had failed to be done on a Saturday so as to be hard and ready for other trades to follow on next week. The foreman plasterer, to avoid delay, remained behind for ten minutes and did it himself. This was seen and reported to the local lodge, which fined him a pound for working overtime, that being strictly forbidden. The rules, in fact, seem to have been so strict as to forbid a concession to the convenience of the employer not much more onerous than any workman might, out of mere politeness, make to a stranger in the street.

I need only refer to such matters as limiting the things that may be done by labourers, and the loads that may be carried, and the tools that may be used by workmen with the object of delaying the work or getting out of it as much money as it may be supposed to owe to the workman. When in early youth, I saw on the Continent certain tools that did their work quickly. I was told by an old workman that they were well enough known here, but they were "unfair" tools, because they got through work too fast. I should like to show him now a machine that does the work twenty times as fast. And, to mention another subject akin to this, the dependence of a grown man on work that in most other countries would be done by boys or women in the expectation that a "living wage"—enough for himself with his household—can be made out of it, is risky, to say the least. Besides the effect of machinery, of articles ready made, and of imported goods and outside labour, besides, even the great questions of work lost and building projects abandoned, there is the exceedingly important question of work lost to trades by changes in modes of construction, apart from the policy of employers or employed.

The demand for fire-resisting construction has already affected very seriously the trade of the carpenter. In London and other places public buildings and many others must by law be constructed very largely in fire-resisting materials. Fire-resisting floors are necessary over certain shops, and will probably be demanded over all. I have found floors of steel and concrete cheaper than good floors of wood. As an examiner in building construction, protests reached me against questions on the framing of floors, because that subject was all out of date! Timber partitions are out of date, and for a large class of buildings wooden roofs will follow suit. In rebuilding the Cripplegate area after the great fire, hardly a roof has failed to be voluntarily made fire-resisting. If the rise in the price of timber is maintained the use of substitutes for carpentry and joinery will be automatically increased. Asbestos that can be fixed dry is dangerous to the joiner as well as to the plasterer; whatever work steel and concrete cannot do it will. The wooden staircase, with scientific handrailing, is gone from important buildings, and wooden lining to the walls and ceilings is gone; all with enthusiastic final farewells! Such losses are beyond preven-

tion, but there are others which might be temporarily staved off.

Masons' work, which for a time recovered its place after its long struggle with imitative cement, has now to compete with cut brickwork and the more threatening terra-cotta (the work of the potter) in most of our finest buildings. It is said that this change was brought about by a masons' strike, but, as a fire resisting material inside or outside a building, stone as hitherto used in the City of London is discredited finally.

In the case of the plasterer, trade disputes are dangerously interesting. From the nature of his work he is the most unpopular artificer to have about a house. In a new building just as the walls are getting dry he comes in and makes everything in a mess for two months or three. Then they have to be dried again. Every effort is being made to dispense with him. Lath and plaster work is forbidden in fire-resisting constructions. There are a dozen substitutes for plaster—none, perhaps, quite so satisfactory. A single architect is now using one of these by the acre. Brickwork is being left bare or painted or whitewashed or "dinged," or covered wifh prepared papers or lincrusta or compo-board or incombustible panelling. Walls that fifty years ago would have been covered with plaster are now finished with glazed brick, or even terra-cotta.

But the plasterer seems to have let slip the artistic and interesting branch of his work. Old ceilings that in this country used to be covered with ornaments, cast or worked in *situ*, ceilings that all over the Continent are now elaborately ornamented, are being done in imitative materials. The richest panelled ceilings are put up in stamped steel. All this while the County Council is giving fabulous thousands to preserve a house in Fleet-street rather than ruin by removal its ceiling, which is a relic of a decaying art.

May we not detect a process something like this in rapid development? All work that requires special skill is getting done by men or by processes outside the regular trade. Work of the simplest kind is being taken up by machinery. And machinery is rapidly encroaching on that which is left between these two. I find in the church records of a small provincial town that, four hundred years ago, when they required a new image of the highest object of their reverence, they employed the very man who hung a gate, mended the bell frame, or set up a pew. When, in early days, I drew and modelled a coat of arms badly, the village mason saw the point and carved it well. His predecessors had furnished the churchyard with tombstones that art enthusiasts now sketch and publish. When I asked one who undertakes stone-carving in a large way whether his men were made out of the better sort of masons, I found that this was not so. The fact that a stone-carver holds his chisel just a shade differently from a stonemason does not seem an insuperable obstacle.

I will only say of brickwork, which seems the least liable to be supplanted, that concrete is encroaching upon it fast—concrete that just failed to become a dangerons substitute twenty years ago, when brickwork was hardly more than half its recent price—concrete that is unskilled labour, that makes such admirable partitions and such reliable retaining walls.

Not merely from curiosity I said to a very enlightened man who is turning out woodwork made with the newest machinery, "I suppose you catch intelligent joiners for this." He said, "No, I begin with the raw material, find a man with a turn for machinery, and we teach him the little joinery he need know." Still, joiners are largely employed in this way, but they are employed in doing the work that it would take many joiners to do by hand, or in fitting together and fixing work from the machine. Not only in the joinery trade, but in others, the enormous quantity of work that is bought by the builder ready made, or is imported, is competing with the contractor's workshop and developing a class of men who are fitters and fixers rather than all-round craftsmen.

At this point it will be convenient to look a little more closely at that which is the real basis of discussion on labour and wages, of negotiation, disputation, and it may be, of quarrel—the work that for whatever reason has to be done. I notice in a certain class of literature a tendency to look upon the work that is going on at any particular time as something that can be and ought to be shared out fairly between the whole body of workmen; or, to take a narrower view, among those of them who belong to a particular organisation. It would be highly convenient if by some means we could so arrange that at all times the number of workers and the amount of work might be made to fit. In default of this we have to handle with our own clumsy and unaccustomed fingers a mechanism of infinite delicacy easily put out of gear. In dull days of depression before the faintest whisper of improving business has been heard; long before the client has dropped the first hint to the architect; even before he has felt the impulse within himself, there has sprung up through influences quite unforeseen, the genial breath that in due time refreshes and revives. Foreknowledge of this would be priceless; the after-knowledge may be read in any paper, and is dear at a penny. Meanwhile let us do as little mischief as we can.

We have to understand and practically apply the truth that every rise in materials, from whatever cause; every increase in wages, however well intentioned; every check placed on the turn-out of work acts with unfailing certainty upon the mechanism I have named with an effect in proportion to the cause.

When the cost of building rises, designs already prepared are "hung up," dimensions and qualities are cut down, buildings are abandoned, the desire to build declines. The builder looks out for cheaper methods of construction and quick working machinery; hand labour is dispensed with; foreign manufactured stuff is imported, and in all ways work is lost to the English workman.

All this is consistent with the appearance of prosperity in trade. The Board of Trade returns show an extremely low percentage of unemployed in the building trades; they do not show the amount of work that is leaving those trades, that is even leaving the country through rises in prices and from other causes which are no less important; and though it is no special business of ours just now, briskness of trade in reference only to the number of workers engaged proves nothing as to the general prosperity of the working class, for if there are numbers kept out of a trade who in the natural course of things would be in it, they have to make a living in some other way, and probably overcrowd other trades. But the whole question seems to deserve careful investigation by some impartial authority. There can be no difficulty in ascertaining from documents the real relation between wages paid and work done, and there can be no insuperable difficulty in estimating the amount which might reasonably have been done.

Practical Englishmen as we are, our mode of dealing with the three chief elements of the labour question, time and pay and work, would excite the emotions of a philosopher of either school—the grave or the gay.

We measure the working hours by the nicest instruments that science can produce, the sun's inconsistencies being detected and exposed. Hence comes the signal which calls the workman to his labour, and that which, at the appointed instant, arrests his impending stroke. The coin that rewards his day's work is weighed to the estimation of a hair, and warranted with all the pomp and ceremony of Goldsmiths' Hall. And yet, on this side the Atlantic, no workman, no employer, no public authority, seriously attempts to apply in our own industry any measurement to the "day's work" itself.

After all our talk it was left for the genius of the Chicago plumber to solve the problem. And surely his method of declaring how much should be done in the seven-hours' day, and then claiming the right to do it in five hours for seven hours' pay, is, in principle, transparently honest and conspicuously fair. For our own credit's sake, I am happy to refer to a home-made scheme on similar principles that seems to be acting fairly well in other important industries.

In the tailoring trade, among others, there is a contrivance mysteriously called a "Log." The tailor works either on daywork or on piecework, but his piecework is done under the disguise of daywork, at so much per hour. Every part of a garment has been valued and estimated in time, and is paid for by the artificial hour. If he finishes a "day's work" in advance of the clock he can leave with his day's pay. If he is behind the clock he must put in more time. But, as I understand, he cannot be sweated in a fair shop that adopts the log. There is no individual bargaining. In arranging for daywork the wage varies according to individual aptitude, both parties having in their mind some reference to the cost of work by the log.

I see no insuperable difficulty in devising for any branch of the building industry a log that may act as a standard day, leaving the wage for the artificial hour to correspond with the wage paid at the time for the actual hour to men on daywork, thus enabling the quick and skilful workman to reap the advantage of his speed and skill, and the less enterprising workman to go on as now at so much a day.

I have formed this opinion with some deliberation, because in the discussion on Mr. Brassey's paper, in which payment by results was very strongly advocated, a prominent labour leader said it was almost impossible to apply piecework throughout a building. But I have before me, and every surveyor has always under his hand, a document called a bill of quantities, in which every item about a building is set down in minute detail. I see a lengthening row of annual price books in which labours are separated from materials and put down in decimal constants. The builder, as contractor, must make up his tender from such separable details, the architect acts upon them, the surveyor digs among them for his daily bread. And yet when the builder, as employer, demands a similar arrangement, he is met with a suggestion of impossibility. That measurement by the 5-ft. rod would cause a hundred times more trouble than measurement by the clock is very probable, and as it is only suggested as a remedy against loitering, this may be used as an argument why the loiterer should mend his pace.

My reference to strikes and lock-outs must be brief. However trivial a dispute may be, the occasion may get magnified to an important question of principle, and for want of a peacemaker at the early stage war may be declared and carried on with a ruthlessness that in the view of the looker-on may be out of all proportion to the point at issue. Whatever may be the occasion, the stoppage of the works of an employer, not only on the job where the dispute arose, but on all his contracts and at his yard, while clients and architects are pressing, while his expenses are going on and his financial engagements have to be met, is a measure that one feels ought by all fair means to be prevented. The general lock-out follows, and after months of loss and suffering to many an arbitrator is called in, who, if appointed at the outset, might have stopped the disaster. It is a very important gain to all concerned that a department of the Board of Trade now invites the submission of disputes to arbitration. The *Labour Gazette* shows month by month what these disputes have been and how they stand or how they have been arranged. More good than appears in print must arise though the establishment of precedents about which the parties will cease to dispute.

The habit of employing a builder to do for you what you cannot conveniently do for yourself has thrown into the background the ancient practice of direct employment, but modern ideas have long been tending that way. It is the distinct and considered policy of certain labour leaders to encourage working without the intervention of a contractor, especially as regards public work. The idea of saving the contractor's profit is tempting to public bodies and to private persons, and the facilities for carrying out the system have been growing very fast. If a client has a fancy to try the experiment, his architect will prepare drawings, and, if he is wise, a surveyor will take out quantities in sufficient detail. He or his trusted agent may proceed to engage a good foreman and workmen, insure against everything, and contract for carting away, buying his raw materials and such scaffolding and tools as he wants for the job. His iron will be ordered long before, and delivered when wanted; his joinery will be imported or got from a manufactory; everything else about a house can be bought from the pattern-books just as easily as it is now selected by the architect. The terms being cash, the lowest quotations may be got; that is proved by experience. The workmen will fix and fit. As they manufacture nothing, no workshops will be required.

At the end of the job, plant and surplus stuff will be sold as a railway contractor would do on completion of his contract. The elements of saving are many. Months may be gained out of the time occupied in completing drawings for a contract. Whether all the con-

tractor's profit is saved may be doubted, but savings in interest on capital, in the prices of materials and fittings, and in salary of a clerk of works should amount to a very considerable sum. Then we are very distinctly promised that the workman will go on faster on direct employment than when working for a contractor, but that would have to be proved. Against these savings must be set off some extra charges for management, but on paper such a plan seems feasible enough. It has actually succeeded in practice, when nothing of importance went wrong.

As to systematic loitering, or other flagrant misconduct, it is certain that a man spending his own money direct would not tolerate it. Not being bound by any contract—that anvil upon which the builder, as employer, can be so effectually hammered—and not being burdened with workshops and expensive machinery, or interest on capital, nor with other undertakings of the same kind open to attack, he could generally afford to wait until men would come forward and carry out his work in a more reasonable way.

It is difficult and disheartening to discard the idea that a company of workmen undertaking contracts might be successful and improve their own position, but after much inquiry I find very little to encourage such a system. Small companies seem to succeed for a time, and then decay through want of business management, or through dissensions among themselves. The best combination I remember in which a contractor's general foreman and a contractor's book-keeper took the lead was as short lived as any other. It may be that in this intricate business there is no prospect open to the workman through the road of co-operation, or it may be that some modification of the system, such as has been tried in France and also in this country, may have better success.

All along, as must have been noticed, I have been harping on that personality outside our fraternity whom I have called the client. My final word about him, like my first, must be to suggest that he is worth more of our consideration than he commonly receives. But I avow that throughout I have been thinking, not so much of the immediate client who comes to us in purple and fine linen, well able to take care of himself, but of that host marching behind him, of which, though indirectly, we are the servants and, in a sense, the pioneers. After we have all had our say, the business of the country must be carried on, and will be carried on; for the public is an imperious master that will not wait indefinitely while its servants squabble over the work.

I have been thinking, amongst other grave and weighty matters, of that which is called the great question of the day, which is pressing upon and puzzling every urban authority in the land: the housing of that class who, through one client or another, must in some way be housed. It is the duty of all of us at this juncture, and not of one section of us more or less than another, to take up our fair share of this burden and bear it as handsomely as we know how.

Partly through the scarcity of vacant land, but also very largely through the increased cost of building, nearly all the societies that have been building for this class have had to suspend their work, and it appears to me that unless the cost of building can be materially reduced, for which purpose a reduction of wages is not necessary, rents will very materially rise, not only in such buildings, but in all buildings in every growing town. Whether the effect of good wages will be to attract any considerable number of the working class who are now deserting the country for the town, time must show.

Apprenticeship of the old pattern in which the youth was bound for seven years, during two or three of which he learnt very little and was of very little practical use, is vanishing with other mediæval customs. That the journeymen in a trade should have consented so long to assist in the training of youths who were so soon to be their rivals may be due in part to the obstinate persistency of habit, and in part to the establishment of a kind of understanding that apprentices should be limited to so few that no practical danger need be apprehended from them. But the workmen have deemed it necessary for their own protection to limit much more strictly than formerly the admittance of apprentices into their trades. So stringent have the rules now become that in some trades it is practically impossible to get a boy apprenticed unless he is the son of a man in that trade. Cases have been mentioned to me in which a master tradesman was not allowed to bring up his own son to his trade.

This may be necessary as a measure of self-defence, and so long as there are enough men in the trade to do the work nobody outside need trouble. But if all the architects and all the surveyors were to combine for the strict limitation of new pupils into offices or new members in their professions it cannot be supposed that positions so lucrative, with prospects so splendid, would not draw in talent quite irrespective of our own interests or our regulations. No doubt the work would at the outset be execrably done, but it would improve day by day, and meanwhile, in whatever fashion, it would unquestionably be done.

Every halfpenny added to the wage per hour, every limitation of the hours of labour, every reduction of the output of work, every addition to the comfort of the workman on the job, every precaution taken and every provision made to protect and insure life and limb is a full-page advertisement for such as are worse-paid, harder-worked, and for whom fewer comforts are provided.

The position of the building operative amongst his fellow men has been improving. There is no reason why he should not, like the poorly-paid French artisan or the doubly-paid American, leave his work at night in a condition as to dress and general appearance good enough for any company into which he may care to go. This cannot fail to appeal to a wider class.

I should like to show you one or two of the board schools in which education is not now directed solely to the production of clerks and university graduates. The children are taught the names and the uses of tools, and to a certain extent how to handle them. You might see three or four hundred boys, with no exception made, taking their turn at drawing, modelling, and rudimentary carpentry or immature engineering. Most of them will go into offices, but not all.

We are yet only at an early stage in the technical instruction of young men. There are institutions in which every kind of help is given them, either for small fees or none, to learn any trade they may wish to take up. At present it is necessary to see that public money is spent only on such as have actually entered their trade, but that is not a rule without exceptions, and the knowledge of tools and processes must very soon become as common as the knowledge of arithmetic.

But I am disposed to think that any increased and more pressing demand for building operatives will be met, as in former times such demands have been met by an influx from the remoter parts of the country where work is slack and the surplus population must go out into the world to gain their bread. And whether as apprentices or as improvers, those of the rising generation whom we are doing so much to train are not likely to ask anybody for leave to earn a living in whatever way they may prefer.

If in my opening sentences on the unity of the building industry I carried my audience with me, I may hope that we shall finish in the like accord. There are thinkers, many architects being of the number, who go so far as to advocate the placing of design and workmanship in the self-same hands. Some say that the designer by profession should, so far as possible, carry his design into execution; others think that none but the trained artisan ought to be entrusted with the design. The millennium may comprehend both or neither. My own suggestion on that particular head shall take the form of a question.

As artists, as men of business, as craftsmen, we are all in the same boat. This is one industry; there is only one craft of masonry and one of carpentry, and one of any other trade. Why should we not all learn them in the same school and at the same bench, at least so far as we have to travel together? The workmen would leave comparatively early in the journey, and the rest of us at stages which preference or necessity might dictate. But so far as we might journey together we should be learning the very same things. We should understand each other for the rest of our lives. And if one who might have started with lower ambitions should find his way into the higher grades of the industry, it is not the class to which I belong that would begrudge him the success which he has earned.

With these suggestions, and those on other points which I have felt able to make, I commit this paper to your candid criticism.

Mr. Chatfeild Clarke said he desired to propose a very hearty vote of thanks to Mr. Blashill for the valuable paper he had read to them. It was one of the most valuable papers that had been read before the Institution in recent years, and the members were especially indebted to Mr. Blashill for his breezy address, which, though long, seemed quite short in the reading. Mr. Blashill must have devoted many hours in the preparation for the paper, which dealt with one of the greatest problems of the century—viz., the labour problem. If the paper was to be considered as Mr. Blashill's diploma paper since elected to the council it was a brilliant example of what could be done in that direction. It was not the intention to discuss the paper that evening, and he therefore moved the adjournment of the debate.

Mr. Daniel Watney seconded the vote of thanks, and said he thought the paper would require a great deal of thought and attention before it could be adequately discussed.

The Chairman, on putting the resolution, said he thoroughly endorsed the remarks made by Mr. Chatfeild Clarke as to the breezy and valuable character of the paper. Mr. Blashill's contribution to the science of political economy was especially valuable, and the point of view required discussion and elucidation.

The vote of thanks having been agreed to, it was announced that the discussion would be adjourned until that day fortnight.

The meeting then terminated.

ELY PLACE, HOLBORN.

AN interesting site will shortly be cleared for re-building purposes. It is at present covered by certain freehold properties—Nos. 15-20, Ely-place and 1-13, Ely-mews, in the rear—yielding a total rental of 1,987*l.* per annum, which were erected in or about 1775 by C. Cole, as architect and builder, instead of, as had been proposed, a new Fleet Prison, upon ground that had vested in Lord Hatton's son-in-law, Daniel, Earl of Winchilsea and Nottingham.

The six houses in Ely-place and the mews stand on the ground formerly occupied by the garden on the north side of the chapel of Ely Place, the London "inn" of the Bishops of Ely. Bishop John de Kirkby, who died in 1290, bequeathed a messuage and ten cottages there, on ground rising from the right bank of the Fleet, to his successors in the See. William de Louth extended the lands, and in 1297 devised them to the See on condition that service should be maintained in St. Ethelreda's Chapel. John de Hotham (*obiit* 1336) planted the vineyard, orchard, kitchen garden, &c., depicted in Aggas's map, and Thomas de Arundel, preferred to the See in 1374, reinstated the residence and the chapel, and built the Stone gatehouse in Holborn, where is now Holborn Viaduct.* We need not rehearse here the story of the occupancy of Ely Place by Sir Christopher Hatton, his nephew, and his nephew's widow, who, having married Sir Edward Coke, died there in 1646. The Bishops of Ely had made several attempts to recover their alienated property, but during Bishop Wren's long imprisonment in the Tower the greater part of the precincts were laid out for Hatton-garden, Hatton-wall, Bleeding Heart-yard, Saffron-hill, Vine, Kirby, Cross, Charles, and other streets. Bishops White, Wren, and Laney died at Ely Place. In Bishop Patrick's time, 1691-1707, a rent-charge of 100*l.* upon the Hatton estate was created in favour of the See, and a plot of ground in Hatton-garden was assigned to the See for a new chapel built by Christopher, Lord Hatton, which is now the St. Andrew's parochial schools, at the corner of Cross-street. Under an Act 12 George III., c. 43, the Crown acquired Ely Place for 6,500*l.*, with a further perpetual annuity of 200*l.* to the bishop, and in its stead built for the See a town house in Dover-street. All of the old Place, the chapel excepted, was pulled down shortly afterwards. St. Ethelreda's Chapel, having served in turn as a military prison and hospital (during the Commonwealth), a soldiers' canteen, beer and wine

* See Mr. H. W. Brewer's drawing, "A Monastic Suburb of Old London in the Sixteenth Century," *Builder*, January 1, 1898; A. Van Wyngaerde's view, *circa* 1550, in the Bodleian Library; and the bird's-eye view, 1572, in Braun and Hogenburg's "Civitates Orbis Terrarum." There are later views by J. Carter, Royce, and S. Hooper.

vaults, a schoolroom and offices for the National Society (1815), and a Welsh Episcopalian church (opened on December 19, 1843), was bought twenty-five years ago for 5,400*l.* by the Lazarist Fathers of Charity, and restored for purposes of divine worship by Mr. John Young, jun., and Mr. Bernard Whelan. In R. Godfrey's print, 1775, the chapel appears as roofless; in 1875 the removal of the slates in a line up to the ridge disclosed the ancient timber roof, after the simple style of the fourteenth century.

Its construction is that of a coupled-rafter roof. There is no ridge-piece, and no longitudinal tie except the two wall-plates and the external boarding. The rafters, averaging 8 in. by 6 in., laid flat-wise, are about 9 in. apart. There is a vertical strut framed into the inner wall-plate and the rafters, and above are cross-pieces and a collar, all about 8 in. by 4 in. All the pieces are united by double tenons, and secured with projecting wooden pegs. The material used appears to be chestnut wood [*? Quercus castanea*] and is in good preservation.—*Builder*, April 24, 1875.

On the north side, which may be seen from the mews, was an entrance into the chapel and its crypt below; the upper doorway remains internally. The beautiful east window was filled in 1879 with stained glass, the Duke of Norfolk's gift, executed by Saunders & Co. after designs by Lonsdale and Mr. F. Weeks, and on St. Ethelreda's day, June 23 of that year, the chapel was rededicated and reopened by Cardinal Manning. On the chapel's south side towards Holborn stood the cloisters, the hall, coeval with the chapel, the colonnade, and the Mitre tavern, of which the sign yet exists. We may add that the Gothic screen and gallery at the west end of the chapel for the organ (by Lewis & Co.) were designed by Mr. Bentley, and that the west window is partly filled with stained glass, representing the martyrs, by Mr. John Hardman. Sir George G. Scott was of opinion that St. Ethelreda's Chapel was built in the period 1290-7. The indenture of conveyance, dated April 4, 1862, between the Bishop of Ely and the Church Estates Commissioners, which conveyed the St. Andrew's Schools in Hatton-garden to the surviving lessees, describes the school house (with a small burial-ground attached) as having been "intended for a church." The property we describe, in Ely-place, was sold on February 23 at the Auction Mart for 36,500*l.*

ARCHITECTURAL SOCIETIES.

THE EDINBURGH ARCHITECTURAL ASSOCIATION.—The members of this Association visited St. Oswald's Church and Bruntsfield House on the 23rd ult. At the former they were received by the Rev. H. J. Wotherspoon, M.A., and were conducted over the building by Mr. Henry F. Kerr, A.R.I.B.A., President of the Association and architect for the church, the cost of which, including all furnishings and furniture, amounted to 7,481*l.* A cordial vote of thanks was accorded to Rev. Mr. Wotherspoon for kindly granting permission, and to Mr. Kerr for acting as leader. By permission of Sir George Warrender, Bart., Bruntsfield House was next visited, Mr. J. T. Baillie acting as leader. Interesting mention was made of the various families who have successively owned the estate since Richard Broun, its first recorded owner. In viewing the mansion-house, the features of the plan and the exterior were dwelt upon, and appreciation was expressed of the fact that although additions have from time to time been made, the oldest part of the existing house still clearly displays the architectural characteristics of its period, and is still inhabited by its owners.

STONEHENGE.—The falling of the upright of one of the trilithons at Stonehenge is shortly to be investigated by a special committee which is being appointed for the purpose of considering the advisability of replacing in an upright position the stone that recently fell, as well as that which fell in 1798. The committee is to be composed of members selected from the Wilts Archæological Society, the Society of Antiquaries of London, the Society for the Protection of Ancient Monuments, joined by one or two local archæologists. Sir Edmund Antrobus, the owner of Stonehenge and the surrounding downland, has appointed his own architect, who will superintend any works that are decided upon; but, fully appreciating the great archæological interest and value of Stonehenge, Sir Edmund Antrobus is prepared, it is stated, to accept any scheme which the committee may suggest.

Illustrations.

WREXHAM CHURCH TOWER.

THE fine drawing of this celebrated tower was made by Mr. Harry Phibbs, and was one of the set of drawings, including several of great merit, which were submitted by him in competition for the Pugin Studentship of the Institute of Architects.

Wrexham Tower was built in the reign of Henry VII. Each succeeding stage of the tower is set back from the face of the one below, so that the parapet is on the inside line of the wall. The hexagonal turrets at the angles are of different heights, that on the north-west corner being the highest, and having a spiral stair right up to the top, where it ends abruptly.

The tower is now undergoing very necessary repair, the turrets and parapets having been restored in 1867.

The resemblance of Wrexham to the usual Somersetshire type of tower has been often remarked; it gives the idea of a Somersetshire tower which has strayed away from its proper county.

ST. ANNE'S CATHEDRAL AND PRESBYTERY, LEEDS.

IN consequence of a street improvement having been decided upon by the Leeds Corporation, it was necessary to acquire the site of the present cathedral, presbytery, and schools, and the whole of these buildings will have, therefore, to be pulled down and built elsewhere.

The site of the proposed cathedral and presbytery is adjoining the old one, with a frontage of about 119 ft. to Cookridge-street, 143 ft. to St. Anne-street, and 170 ft. to Great George-street, with about 75 ft. to a private road, so that it is almost on an isolated site.

The shape of the site, being very wide in comparison to its length, has involved a treatment of plan with a wide nave of 42 ft. and double side aisles, with all the altars at the east end. The principal entrances are at the west end.

The section of nave shows a flat, segmental pointed roof, with nave piers and arches carried up as high as possible, in order to give loftiness. The side aisles have also flat roofs over them, in order to get the utmost height for clearstory and aisle windows.

The choir and sanctuary, which is about 30 ft. wide by 50 ft. long, has an ambulatory all round, and there is a gallery over the latter for the organ and orchestra or additional choir. There are two turret staircases. The roof to this gallery runs through level with that of the nave, and is treated in a similar way.

The high altar will be treated simply with choice marbles, and will have a lofty baldachino over it, and a reredos of carved wood coloured and gilt.

The chapter house, which is approached from ambulatory, is octagonal in plan, and is situated at the east end of St. Anne-street; underneath will be a parish-room, about 40 ft. by 21 ft., entered by porches from St. Anne-street, and from the presbytery by a small turret staircase.

The reredos to the present high altar will be removed, and erected behind the altar in the Lady Chapel.

The two sacristies, which are placed in the George-street front, will be about 30 ft. by 20 ft. each, and are in connexion with the ambulatory and presbytery, the boys' sacristy having a separate entrance from George-street.

The presbytery is situated at the north-east end of the site, having a frontage of about 50 ft. to George-street and 75 ft. to the private road.

The first floor provides accommodation for the sitting-rooms and bedrooms of the canon and priests of the cathedral. The ground floor provides large dining-room, serving-room, and lift, reception-room, smoking-room, and parlour or waiting-room, with central hall, and staircase with large lantern light over it. The ground-floor level of the presbytery is almost level with the gallery over the ambulatory round the choir, so that this gallery can be easily entered from the presbytery staircase, and there is also an oriel window projecting into the sanctuary from a landing of this staircase, which affords a view over the whole interior of the cathedral.

The basement of the presbytery has a kitchen, scullery, larder, beer, coal, and wine cellar, laundry, servants' sitting-room, &c. The windows of same to George-street are almost clear above level of ground.

The nave, aisles, Lady Chapel, and transept will seat 850 persons, and the choir 50, exclusive of canons' stalls.

The materials of construction are as follows:—

The external walls of the cathedral are to be faced with Weldon stone and Ketton stone for dressings, and for tracery, carvings, mouldings, &c.

The internal finish will be of Corsham Down stone.

The wide 42-ft. span of nave roof has principals of latticed steel ribs, and the roofs are covered with Delabole slating.

The external walls of the presbytery are to be faced with sand-faced Suffolk bricks, and Ketton stone in the porch, pilasters, strings, niches, copings, &c.

The floor of the nave and aisles is to be of wood-block flooring, with terrazzo paving to the aisles. The paving of the sanctuary and choir will be of marble.

The cost of the whole, including heating, seating, organ rebuilding, &c., will be about 36,000*l.*

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

THE ROYAL SCHOOL OF ART NEEDLEWORK.

THE old building of this school has been for some years inadequate in many ways for the excellent work produced there, and recent developments necessitated the erection of the new building visited by the Association on their second spring visit on the 2nd inst. Although the site chosen at the corner of the Exhibition-road and the Institute-road is ideal from several points of view, the close proximity of the Imperial Institute and the Technical Training College has rendered the task of the architect, Mr. F. B. Wade, a problem of striking contrast to either building.

The new school, which is approaching the finishing stages, is a three-storied building mainly carried up in Portland stone, with the exception of the wall surfaces of the main floor, which are in red brickwork. The rectangular plan is arranged with an open court above the semi-basement.

Two large apartments extending the whole length of the south front are for the display of finished work, and these form the most prominent features of the scheme.

The whole of the semi-basement is planned for work and lecture rooms, and, together with the back wings of the main building, a large amount of accommodation is provided for extending the various classes and lectures so essential for the proper working of the school.

It is to be regretted that at the present time it is not proposed to complete the outside carving. In a building of this description "blocks left for carving" would suggest a plea for poverty, unfortunately too frequently met with. There is always a danger when scaffolding is once removed from a new work that this disfigurement of incompleteness is for an indefinite period.

Miss Wade, the manageress of the school, conducted the members over the old building and gave them interesting descriptions of the work carried on. The various designs for tapestry and decorative panels were of great interest and demonstrated the excellence of the education to be obtained at the classes.

Mr. Wade personally explained the drawings of the new building, and the thanks of the Association are due to him for an interesting visit.

DIRECTORY OF TELEGRAPHIC ADDRESSES.—We have received from Mr. Henry Sell, of Fleet-street, a copy of "Sell's Directory of Registered Telegraphic Addresses" for 1901, which has been compiled from official lists, and which contains all the information received from the Post Office to January 1. As we have previously remarked, the directory is a very reliable one, and includes an exhaustive list of London and provincial telegraphic addresses, alphabetically arranged — in the first section under the names of firms and in the second section under the telegraphic address, with number showing the page on which the name and address of a firm appears. The directory also gives the telephone number of various firms. A new feature of the 1901 edition is a list of our Consuls in foreign countries, classified under the towns in which they are resident. With the volume is issued a map of South Africa in colours.

THE CHURCH CRAFTS LEAGUE.

A MEETING of members of this society was held on the 28th ult. at the Vale Studio, King's-road, Chelsea, S.W., when the President, the Bishop of Rochester, occupied the chair. The subject down for discussion was "The Present Disuse of Art in the Church—its Reasons and Results," and the chairman called on Dr. Biggs to read a paper on the subject.

Dr. Biggs prefaced his remarks by calling attention to the attempts which the church had made towards art in the latter part of the nineteenth century, as instanced in such buildings as All Saints, Margaret-street, Keble College Chapel, and several others. He also dealt with some of the difficulties which clergy and committees had to meet in dealing with artists. In his opinion greater accuracy of detail was wanted in the artistic treatment of biblical scenes and subjects. Many people visited Palestine now, and these travellers were often disappointed because the actual country was so unlike any representations of it they had seen in their churches. At the same time he appealed to artists to treat sacred subjects in the traditional manner which had been laid down by the church, and which distinguished sacred art from secular.

Mr. Lionel Cust, the next speaker, referred at length to the historical view of the subject, pointing out the causes which led to the practical abolition of art in our churches at the time of the Reformation.

Mr. Selwyn Image disagreed with Dr. Biggs as to the distinction between sacred and secular art. Art was a man's self, and his individuality must impress itself on everything that he did. In work intended for a church the artist confined himself to certain subjects, and in work intended for a drawing-room he dealt with other subjects, but beyond this there could be no further distinction between sacred and secular art. He reminded the meeting that in days when Gothic churches were built, people also built Gothic houses. Every artist had an individuality, and each age had a style. Therefore, if any person or firm offered to do work in any style required, it might be taken for granted that the work would be bad. Although we lived in an age which (for many social and economic reasons) had no style, yet every artist had an individuality which must impress itself on everything he did.

After an interesting discussion, in which Canon Armitage Robinson, Mr. H. Wilson, Mr. John P. Seddon, Mr. W. S. Frith, and Mr. T. Stirling Lee took part, the Bishop of Rochester expressed his appreciation and thankfulness for the remarks which had fallen from the clergy and the artists present. The two professions had much in common, and the Church Crafts League would justify its existence if it only called together such meetings as the one they were having that evening. The subject they had been dealing with was of tremendous importance, and he hoped soon to have another opportunity of hearing the subject discussed.

The next general meeting of the League will be held early in May. Any non-members caring to attend will be welcome. Tickets can be had from the Secretary of the League, at the Church House, Westminster, S.W.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution held at the Westminster Palace Hotel on March 1, the Chairman, Mr. Percival Marshall, presiding, a paper was read on "Carburetted Water Gas" by Mr. S. Cutler, jun., M.I.Mech.E. After reviewing the progress of the carburetted gas industry since its introduction into this country in 1891, the author proceeded to indicate a few reasons why the system had been adopted as an auxiliary plant in conjunction with coal gas apparatus for the production of illuminating gas, the principal being the prevailing scarcity of cannel, which had been extensively used as an enricher to increase the illuminating power of the gas obtained from common coal to a degree prescribed by the statutory standard. The importation of cheap carburetting oils rendered the process of carburetted water gas an economical one, and many plants were installed. It was soon found the system was possessed of several advantages, which led to its fairly extensive use. The principal features of the plant were the independence of labour, rapidity of production, utilisation of a large portion of a bye product of the coal, viz., coke, assistance in the prevention of napthalene deposits, smaller capital cost, and reduced area for accommodation of the apparatus. It was not surprising that engineers in the United States, where there are vast oil supplies, should be the first to evolve a practical plant, and of the many types tried, the "Lowe" apparatus had met with most favour, and formed the basis of most of the present day plants. With the aid of diagrams the method of manufacture was then described, the complete apparatus necessary for the production and purification of the carburetted water gas being illustrated. The manner in which the raw gas-making materials—water, carbon, and petroleum—became transformed into the finished illuminating gas was traced from stage to stage, and the chemical reactions occurring in the generator and analysis showing the various changes in the composition of the gas in the course of its passage through the different vessels of the plant, were included on a sectional diagram of the generating portion of the apparatus. Special reference was made to the constituents, carbon monoxide and carbon dioxide. In the year 1897, at which time twenty companies and eleven corporations had installed plants at their works, the Home Office instituted an inquiry as to the unlimited use of a gas containing 30 per cent. of carbon monoxide on account of its well-known toxic properties. The result was a recommendation for restricted use, but at present no legal limit had been enforced. English gas companies, however, did not desire to, or rarely did, exceed a limit of more than 30 to 40 per cent. of water gas in their total production. In America, on the other hand, over 70 per cent. of the total gas consumed was pure carburetted water gas. Various details of the plant were next considered, including the method of dealing with the effluents from the washers and the separation of tar, a process attended with some difficulty, owing to the slight differences in the specific gravities of the liquids. A safety gear, a model of which was exhibited, was described. By means of this gear the operator was enabled to perform in proper sequence the various changes of valves from "run" to "blow," and *vice versa*. The question of oil was next entered into, and it was pointed out that as the cost of this ingredient formed over 60 per cent. of the total cost of the gas, it was of great importance to obtain from it the highest possible duty. The author, in conclusion, referred to the present position of carburetted water gas in relation to the coal industry. The enhanced prices of oil had restricted somewhat the use of the system as a means of producing the gas as economically as coal gas was obtained; the value of the process was, therefore, exemplified more in collateral advantages. That companies and municipal corporations were still adopting and extending the process indicated that the benefits to be derived from its introduction were unmistakably definite.—A discussion ensued, and a vote of thanks having been accorded the author, the proceedings closed with the announcement of a visit, arranged in connexion with the paper, to take place on March 9, when the Southall station of the Brentford Gas Company would be open for inspection, including the plant for the manufacture of carburetted water gas.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on the 4th inst., Mr. Charles Mason, President, in the chair, a paper was read on "Notes on Certain Details of Drainage Construction," by Mr. Gerard J. G. Jensen. The author, at the outset, pointed out the desirability of giving attention to the merest details in drainage construction, and he then proceeded to discuss certain matters which up to the present have been misunderstood or neglected. Amongst these, none, he thought, claimed greater attention than the construction and arrangement of ventilation pipes. He drew attention to the reprehensible practice of constructing ventilation pipes of iron, as they were invariably found to rust in the interior, thereby not only deteriorating and making renewal necessary, but also becoming blocked and thereby rendering insanitary that which might otherwise be a good system of drainage. This latter, he pointed out, was especially serious in view of the fact that the householders who have their drains periodically inspected are still in the minority. Amongst other details of construction pertaining to ventilation pipes, he further brought under notice the still inexact knowledge regarding the action of drain air upon the human constitution. Pending a more complete knowledge on the subject, he urged the necessity of erring upon the safe side in choosing positions for liberating drain air through ventilation pipes. As tending to prove the evil effects which might ensue from neglect on this point, he instanced the case of a large school in which he had traced the cause of various outbreaks of follicular tonsilitis to the faulty arrangement of ventilation pipes, which in most cases were placed near the dormitory windows. The wards of a recently-erected sanatorium at the same school, he stated, were under similar influence, and though it still remained to be seen whether any evil results would ensue, he regretted that those about to be experimented upon were not guinea-pigs, nor rats, but human beings. Continuing, the author touched upon the still frequent practice of providing waste-pipes with hopper heads at the points at which branches from fittings within the house join the main pipe. He could imagine no more insanitary and offence-giving construction, and thought that the fullest measure of the evils of the system was perhaps experienced under the, at present, fashionable flat life. An alternative and more satisfactory system of arranging and constructing waste-pipes was described, as were also the most efficient methods of arranging their discharge into surface traps. Some observations on manholes and drain joints followed, the paper concluding with some remarks on overflow pipes from lavatory basins, baths, and sinks. The author considered that too little attention is, as a rule, bestowed upon these details, and suggests that the musty smells in bath-rooms and similar apartments might frequently be ascribed to faulty overflows. The continued manufacture and use of uncleanly overflow-pipes, he thought, must be one of the wonders of house drainage, since their evils must be patent to all. The paper was illustrated by a number of diagrams.

COMPETITIONS.

HULL ROYAL INFIRMARY EXTENSIONS.—The assessors in this Competition have just made their award on the designs submitted in competition. The first premium has been awarded to No. 3, submitted by Messrs. Worthington & Sons, Manchester, and the second premium to design No. 4, submitted by Mr. T. Percy Adams, 28, Woburn-place, London.

ST. MATTHIAS SCHOOLS, SALFORD.—The Improvement Committee of the Salford Corporation received a number of plans in answer to their advertisement inviting competitive designs for the erection of the new St. Matthias Schools. The plans were referred to the assessor, Mr. Royle, of Messrs. Royle & Bennett, architects, Manchester, to choose out of the number of plans sent in (viz., seventy-two) not more than ten as designs for the consideration of the Committee. A sub-committee carefully examined these plans, with the assistance of the Clerk to the Salford School Board, and eventually made the following awards:—(1st) Plan No. 59; (2nd) Plan No. 29; (3rd) Plan No. 22. The corresponding envelopes containing the names of the competing architects were thereupon opened, and it was found that the successful architects are:—Plan 59, Mr. Benjamin Bower (Birmingham); Plan 29, Messrs. Woodhouse & Willoughby (Manchester); Plan 22, Mr. Alfred H. Mills (Manchester). The plans which have been received will be on view at the Town Hall on the 12th and 13th insts.

PUBLIC SHELTER, FLEETWOOD, LANCS.—The design placed first in the competition for public shelter, with pleasure grounds, Fleetwood, Lancs, is by Mr. H. A. Luke, R.E. Office, Curragh Camp, co. Kildare, Ireland.

NEW HEAD OFFICES FOR NORWICH UNION LIFE INSURANCE.—In a limited competition for new buildings at Norwich for the above-named insurance company, the design of Messrs. G. J. and F. W. Skipper, of Norwich, has been placed first, and that by Mr. A. R Mayston, of London, second.

PROPOSED ADDITIONS TO ST. PETER'S CHURCH, EASTBOURNE.—It is proposed to build a new choir vestry and practice-room at St. Peter's Church, Eastbourne. Mr. C. W. Tomes, of Eastbourne, has prepared the plans.

Books.

The Mechanical Triumphs of the Ancient Egyptians. By Commander F. M. BARBER, United States Navy (retired). London: Kegan Paul & Co. 1900.

THE author of this small book has endeavoured to sum up the evidence and the probabilities in regard to the manner in which the Egyptians moved and raised their immense colossi, and finished the outer casing of the pyramids; the latter operation being, as he says, the real problem in regard to the pyramids, as the mere piling up of material without any outside finish was, with unlimited compulsory labour, only a matter of time. As far as the question of the use and capabilities of tackle of any kind are concerned, a naval officer has some special qualifications for treating the subject, from his professional experience in the use of ropes and hoisting tackle; and Captain Barber's observations on the ancient Egyptian representations of boats and the way they are rigged, and on the way the obelisks appear to have been secured on the boats, are of considerable interest. Whether he brings us any nearer solving the question as to the *modus operandi* of finishing the pyramids is doubtful; in fact, his views seem rather contradictory. He assumes that the Egyptians were a very scientific people, yet he points out that they seem to have had no means of moving a colossal statue from the place where it was made to its ultimate destination except by the sheer pull of hundreds of men. He remarks that the use of men instead of animals for such labour was probably because they could be trained to pull by repeated efforts at a word of command in a way that animals could not; which is a point we have not seen remarked on before in connexion with this subject. But in regard to the pyramids he falls back on the idea of an immense inclined plane of earth collected and built up, with a longer and longer slope as the pyramid rose higher; up which slope the stones were hauled by the sheer pull of hundreds of men, as with the transport of the colossi along the level. The objection as to the immense amount of material which must have been piled for such a purpose, only to be removed again, he considers to be met again by the consideration of the unlimited unpaid labour which was at the command of the Egyptian rulers; this is an answer, of course, but it is surely incompatible with the idea of the Egyptians being a scientific people; it is about as bungling and roundabout a method as could be imagined.

It is curious that the numerous representations of men at work, in Egyptian paintings, show nothing of such tackle as would have been necessary in order to raise the finishing courses of the pyramids to their places. But we may take it for granted that where there is the general and free use of ropes, of which, in the case of the Egyptians, we have ample evidence, there will be the knowledge and use of the pulley; and the description by Herodotus of the manner in which he was informed that the stones were raised is quite according to reason and common sense as far as it goes, and only presupposes the idea of ropes, pulleys, and a swinging arm or else a simple form of traveller:—

> "The pyramid was built in steps, battlement-wise, as it is called, or, according to others, altar-wise. After laying the stones for the base, they raised the remaining stones to their places by means of machines formed of short wooden planks. The first machine raised them from the ground to the top of the first step. On this there was another machine, which received the stone upon its arrival, and conveyed it to the second step, whence a third machine advanced it still higher. Either they had as many machines as there were steps in the pyramid, or possibly they had but a single machine, which being easily moved, was transferred from tier to tier as the stone rose,—both accounts are given, and therefore I mention both. The upper portion of the pyramid was finished first, then the middle, and finally the part which was lowest and nearest the ground."
>
> (Herodotus: Rawlinson's translation.)

The last sentence is thoroughly practical; the pyramid being first built so as to leave a succession of steps on the face, the final casing, which would fill in and obliterate the steps, would naturally be commenced at the top, the lower steps serving as stages for raising the blocks to the courses above them.

Although the visit of Herodotus to Egypt was so long posterior to the erection of the Great Pyramids, it is reasonable to suppose that the correct tradition still remained as to the manner in which they had been built, in a land where all things were so slow to change; and certainly the idea which he suggests as to the *modus operandi* is far more reasonable and probable than the inclined plane theory which Captain Barber has endeavoured to revive, and which would leave us to suppose that the Egyptians were deficient in all but the most primitive methods of construction, worthy only of a barbarous people.

The Architectural History of the Cathedral Church and Monastery of St. Andrew at Rochester. By W. H. ST. JOHN HOPE, M.A. London: Mitchell & Hughes.

ARCHITECTURAL descriptions of minsters and monasteries by Mr. St. John Hope are always worthy of attention, and the evidences with regard to buildings from chartularies or other documents are always reliable. This monograph on Rochester, to a considerable extent a republication of previous papers, fully sustains his reputation for accuracy and clear judgment.

The series of plans are invaluable adjuncts to the letterpress, and are made most explicit through their careful colouring. The first one is a conjectural plan of Gundulf's work (1077-1090) showing the existing remains, which are chiefly on the south side of the nave. The Early Norman work (1095-1100) is carefully distinguished. The foundations of the Early Saxon church of 604 are also shown at the west end. The second plan gives the whole of the minster as it now stands, and is of a most elaborate, but, at the same time, clear character. It brings before us at a glance no fewer than twelve different periods—Early Norman, Later Norman, repairs after fire of 1179, new presbytery (1200-1215), new choir of William of Hoo (1227), contemporary work in choir aisles, north transept (1240-1255), south transept from 1280, alterations from 1300, insertions *c.* 1340 and later, fifteenth century works, and post-Suppression and modern.

The third plan deals with the crypt, and here we are able to distinguish between seven different dates, according to Mr. Hope's deductions from observation and evidence.

The fourth plan deals with Rochester Priory, giving a plan of the precinct based on the Ordnance Survey. The mediæval remains are coloured red, and it is interesting to note that they are far more considerable than is usually supposed.

The last plan is also of Rochester Priory, but is confined to the church and monastic buildings. By an ingenious arrangement, the choir and presbytery in this plan can be raised, showing the intricate crypt arrangement immediately below. It reminds one of the exciting surprises in some of the superior toy-books of one's childhood.

Mr. Hope gives his reason for assuming that the foundations at the west front, which were discovered in 1888, and which contained a good deal of Roman material, are the remains of the church built by Æthelbert in 604. Its measurements are almost identical with the small church of St. Pancras, at Canterbury, and harmonise with two other early Kent churches—St. Martin's, at Canterbury, and the foundations of Æthelburga's church at Lyminge. All these have been personally planned by Mr. Hope.

The account of the monastery is of particular value, for it represents the careful investigation and planning which Mr. Hope undertook in the "eighties" when resident at Rochester for four years. He had also the run of the muniment room, and was fortunate in lighting upon sundry useful pieces of information. The buildings of the Benedictine priory attached to the Cathedral church of Rochester occupied a most unusual position, for they were erected on the south side of the presbytery, instead of being north or south of the nave. This had an important effect on the disposition of the claustral buildings.

In addition to the plans, which are Mr. Hope's own work, there are a variety of illustrations specially drawn by Mr. Roland W. Paul, whilst others have been lent by Messrs. Murray and Messrs. Parker & Co. Several of the new ones by Mr. Paul cannot fail to be of service to architects as well as of interest to the general reader. A slip inserted by Messrs. Mitchell & Hughes mentions that there are only 200 copies of this monograph for sale. We shall be surprised if they remain long in the market.

The Churches of Rouen. By the Rev. THOMAS PERKINS, M.A., F.R.A.S. London: George Bell & Sons. 1900.

"ROUEN" is certainly one of the best of Messrs. Bell's handbooks. The cathedral and the churches of St. Ouen and St. Maclou present, it is true, so much interest that it should be a difficult matter for an author to fail in making a small book on such subjects a readable one. Nevertheless, the characteristics of these churches are so various, their architecture is representative of so many periods, that to attempt to treat of them without a generous catholicity of opinion would have resulted in the production of a handbook so negative in its tendency as to leave but little that was beneficial or helpful to the reader anxious to admire. Mr. Perkins wisely, as we think, finds something to praise in that period of French architecture which may almost be said to be a renaissance of former styles rather than a style itself. We have nothing that corresponds to it in English mediæval work. Our Perpendicular style developed beneath the steady process of evolution. In France the architects of the closing fifteenth century and of the sixteenth arranged a theme with variations based upon the features of styles gone by.

Thus, to any one seeking such inspiration as originality gives, much of the detail composing the cathedral must strike him as disappointing. If, however, he will but abate his rigour and regard the whole as something that is wonderfully picturesque, he cannot be otherwise than well satisfied. If he desires refinement he will find it at St. Ouen; indeed, he may possibly find too much. To those who regard the *finale* of Gothic architecture as an attempt to reduce all points of support to the lowest terms, St. Ouen will stand as a revelation. Yet it may reasonably be questioned whether, in its endeavour to secure grace, it has not sacrificed that architectural birthright—the evidence of stability.

The book is furnished with many good photographs, which simplify, and increase the value of, the text. These have been taken by the author himself, who has been thereby enabled to select those points of view best suited to his remarks. The preface acknowledges a debt due to the courteous sacristan of St. Ouen, M. Edouard Julien. We also have a lively recollection of Edouard; indeed, he and the church over whose safety he presides are inseparable in our mind. Hitherto he has been satisfied to quote the opinions of Mr. Ruskin; we hope that he may now add those of Mr. Perkins.

We may remind our readers that a fine drawing by Mr. Brewer of the spires and towers of Rouen amid their picturesque surroundings appeared in our New Year's issue. The city has already suffered much by the exigencies of modern improvement, and is likely to suffer still more. Such a record is therefore particularly valuable.

Old Cottages and Farmhouses in Kent and Sussex. Illustrated in 100 Plates printed in Collotype from a Special Series of Photographs taken by W. GALSWORTHY DAVIE, with some Descriptive Notes and Sketches by E. GUY DAWBER, Architect. London: B. T. Batsford. 1900.

ANY work on the domestic architecture of England is always welcome; the subject is one of inexhaustible interest in itself, and to students of architecture is associated with the pleasantest of their duties—that of wandering, sketch-book in hand, from village to village, wherever and whenever opportunity permits. The present work is confined to the illustration and analysis of the smaller and more homely architecture of the villages of Kent and Sussex.

Mr. Dawber points out that the architecture of the larger houses, which has been the subject of so much research, is a subject apart, owing, as it does, much to foreign influence and workmen. The English tradition is clearly defined in the country cottages and yeoman's houses, where every noticeable change in appearance is one of adaptation to requirements; in Mr. Dawber's words, "They never pretend to be anything but what they are, and there seems to be no effort in either their construction or ornamentation, but merely a simple handing on from generation to generation of well worn

and tried tradition." The notes and sketch diagrams illustrating the photographic plates, emphasise the all-important details which compose the little architectural harmonies, and will help the student to study old work in the most advantageous way. For to be able to indicate the elements that make the charm of the old work in a clear and sympathetic manner is a step towards good design in modern cottages and small houses, where all agree that the work of the past is worthy of emulation. The first point attention is drawn to, is the distinctive character given to districts by their geological formation. Thus in Sussex the buildings were mostly built of timber, until the iron industry, once so prosperous in this now agricultural county, destroyed its forests for use in smelting the iron ore. The appearance of these timber-framed houses is different in character to those of the timber building counties of Shropshire and Lancashire. Mr. Dawber merely points out that they are less elaborate and more purely constructional; we suppose the reason for this is partly due to the larger houses in the south being built of stone or brick, whereas in the north they were very often entirely of timber, and are besides of a later date. Among other features that influenced the design of these smaller houses, attention is drawn to the fine breadth of feeling and proportion that the old builders attained in their chimneys, a feature much neglected in modern cottages; and also to the roof, with its broad expanse of thatch or tiles, that gives such a sense of sheltering protection to the houses. The quiet plaster fronts are more frequently found in Kent than in Sussex, in which county flint and link diaper are also used with picturesque effect. The book, with its 100 well-chosen photographic plates, is a valuable record of these counties presented in a very attractive form.

A Short History of Renaissance Architecture in England, 1500-1800. By REGINALD BLOMFIELD, M.A. George Bell & Sons, London, 1900.

IN our issues of April 16 and 23, 1898, we reviewed this important work in detail. The present edition is a somewhat abridged form of the same work in a small single volume forming a handbook of the subject. A valuable addition is a plate of the five orders of Palladio, taken from Fréart's "Parallel." Considering the great technical importance of the orders in the architecture of the seventeenth and eighteenth centuries, the student of the Renaissance cannot have these models too firmly impressed upon his memory. The omissions in the smaller work are amongst the illustrations, which are reduced to the most important examples connected with each stage and cause of the historical development of the Renaissance; and also those parts of the original text dealing with architectural treatises and literature.

Laxton's Builder's Price-Book for 1901. Originally Compiled by WILLIAM LAXTON. Eighty-fourth Edition. London: Kelly's Directories, Limited.

ONE cannot study this latest volume and compare it with one of the earlier ones without being struck by the great improvement in the matter and form, and especially in regard to the prime object of the work, *i.e.*, the prices. The time has now passed for the surveyor, when dealing with the builder, sarcastically to suggest that "perhaps he would like Laxton's prices." Possibly this may be due to the healthy competition of that other now recognised price-book, "Lockwood," noticed below. Be that as it may, the effect is, that the Laxton of the present day so far exceeds in usefulness the earlier editions, that, if there is a use for a price-book, one wonders to what extent these earlier editions answered their purpose.

We are pleased to see that the carpenter's prices have been revised throughout, but generally there has been little need for revision. There are still some unfortunate anomalies which it would be well to eliminate. Really it is about time that pages 274-5 were rewritten, and steel given its due as a constructive material. How many architects, we wonder, now specify rolled iron joists; and even this list is given without weights.

Taking all things into consideration, however, "Laxton" will doubtless still find a place upon the shelves as the father of the other works of the same nature, and deservedly so.

Lockwood's Builder's and Contractor's Price-Book for 1901. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. London: Crosby Lockwood & Son. 1901.

THE prices for building work having remained almost stationary for the past twelve months, with the exception of one or two branches, the work of the reviser of price-books has been somewhat light. Light as this work has been, the editor has hardly done all he could in this direction, no note having been taken of the continued rise in timber, which has reached a price almost unprecedented. Almost the only reduction during the year—and that during the later months—was in steel constructional work. The prices quoted are rather high, but the reduction is so uncertain that possibly there is an excuse for no note being taken of this. The heading given is merely "Wrought Steel," but certainly something should be said as to whether of English or foreign manufacture. The prices would indicate that "English" is referred to.

There is the usual mass of general information—legal and otherwise—and tables, which all tend to make the work useful in other directions than those for which it is specially designed.

The production of this work of late years has been so much improved as to make it a formidable competitor with its much older companion, "Laxton," which for so long held its position as a standard work—a healthy competition, nevertheless, of which the users of a price-book reap the advantage.

A Practical Treatise upon Steam-Heating By FREDERICK DYE, M.R.I. London: E. & F. N. Spon, Limited. 1901. 238 pp.

IN his preface Mr. Dye draws attention to the want of an English book on the subject of heating buildings by steam, and considers that this is one reason why steam-heating has not been more generally adopted in this country. In factories with steam-power, steam has, of course, been largely used for heating for a great many years, but installations in other buildings have not been so entirely successful as to encourage architects to prefer steam to hot water. The principal objections to steam are the noises in the pipes — often so loud as to terrify timid people —the difficulty of regulating the heat, and the rapidity with which the pipes cool. The last objection loses its force in the case of buildings which are occupied only for short periods, such as places of worship, concert-rooms, and theatres, and neither of the other objections is insurmountable, as Mr. Dye's book shows. Steam-heating has, however, been adopted in this country to a greater extent than Mr. Dye seems aware of; English architects and engineers are not all unacquainted with American books on the subject, such as Baldwin's "Steam-Heating for Buildings," the writer's copy of which (dated 1895) bears the legend, "Thirteenth Edition," and the subject has not been entirely neglected by English writers. Mr. Dye's book, however, is a valuable addition to the literature concerning steam-heating, and can be recommended as a trustworthy source of information. The author writes without bias, pointing out the defects as well as the advantages of the system, and giving particulars of every part of the apparatus. The chapter on boilers is somewhat inadequate, but with this exception the different kinds of low-pressure and high-pressure apparatus are fully described. The expression, "much data is available" (p. 117), must be corrected in the next edition, and also the statement, on p. 137, that in buildings heated with low-pressure steam "the air . . . undergoes no perceivable change in dryness."

The book is well illustrated, and contains a large amount of information which cannot fail to be of service to architects and engineers, as steam is undoubtedly a valuable heating agent for certain classes of building.

Exercises in Graphic Statics: with Examples of its Application to Practical Designing of Constructional Ironwork. By G. F. CHARNOCK, A.M.Inst.C.E. Part II. Manchester: J. Halden & Co. 1900.

THE second part of Mr. Charnock's exposition of graphics is chiefly devoted to a consideration of beams and girders. Altogether, there are fifty-two sheets of diagrams, with explanatory letterpress; a few of the diagrams relating to work coming under the especial province of the civil engineer, but the greater part of the work is of particular interest to the architect and the builder. Of course, it is to be understood that the volume is addressed to students, yet its contents should prove of great assistance to those who wish to ascertain for themselves the actual value of beams or stanchions for some particular purpose. It is not infrequently the case that the essential factors for a given calculation are not to be found ready made in the ordinary book of tables. A knowledge of the methods which are so ably expounded by the author would at once remove the difficulty thereby experienced. Dealing with simple and compound beams of various types, the use of rolled joists as stanchions, the design of steelwork in floors and roofs, and the forms and proportions of riveted joints, this set of diagrams is one of much intrinsic value.

TRADE CATALOGUES.

THE Goheen Manufacturing Company, of Canton, Ohio, U.S.A., has sent us a pamphlet on "The Preservation of Wood, Steel, and Galvanised Surfaces." This company manufactures all the common varieties of paint, but makes a specialty of the manufacture of a paint termed "carbonising coating," which, it is claimed, will protect exposed iron and steel from corrosion for a period of from ten to fifteen years, and which, owing to its remarkable covering capacity, is the most economical protective paint on the market. It is well known, says the pamphlet, that the steel as manufactured in structural shapes of to-day is a much harder body to protect from rust than the iron used years ago, and consequently requires special care in the matter of paint. The use of red lead is deprecated, as the red lead "dries too rapidly and hard (at the expense of the oil), becoming brittle, and does not allow for the expansion and contraction of the metal." In the chapter on "Mistaken Expert Testimony on Red Lead" we are told that "many of the trade booklets which find their way into the hands of the engineer and structural builder, calculating, as they do, to foist some special brand of paint as being the most permanent paint for iron and steel, contain theories, assertions, and ideas which, to a careful reader, do not accord with the laws of Nature, chemistry, or practical demonstration. These false theories emanate from a want of knowledge, misunderstanding, or in an attempt at nulling all other coatings save the one which they are desirous of selling." We agree; and although the booklet before us strongly advocates the use of a certain paint, of a composition not quoted, which is manufactured only by the Goheen Manufacturing Company, and contains statements and theories which will not pass unchallenged, it is by no means devoid of information which may be of practical utility to those who have to select paint for various purposes.

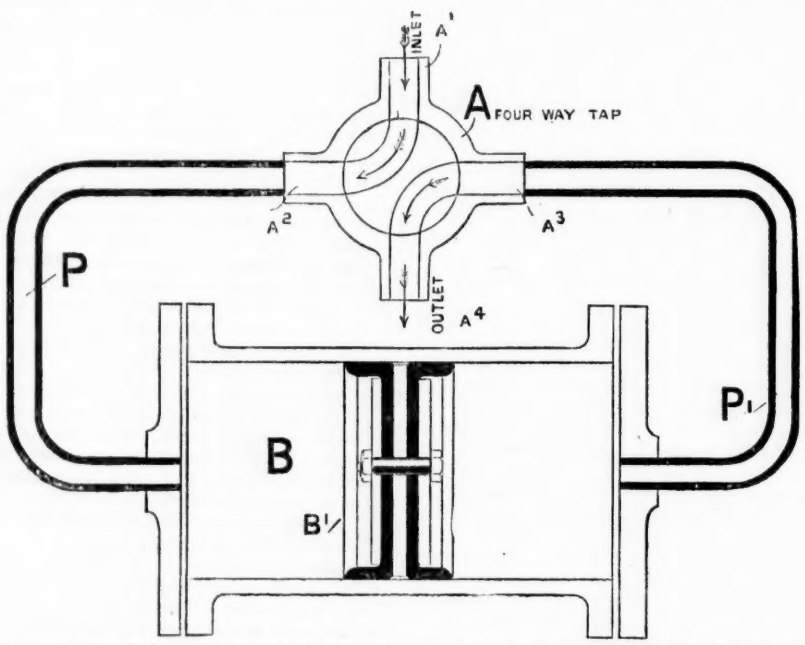
Messrs. Lockerbie & Wilkinson send us a finely got-up catalogue of locks, brass foundry, ironmongery, &c. The illustrations are all by photographs from the original objects. The mortice lock furniture shows a variety of designs mostly in very good style, both in wood and metal. Large sized photographs of the interiors of the locks are given, so that their construction can be studied almost as from examination of the originals. The weighted mortice lock, in which the return of the latch to its position is actuated by a weight instead of a spring, is particularly worthy of attention. The catalogue includes also rim locks, rim night latches, stock locks, light weighted mortice locks and lock handles, lock and finger plates in brass and in beaten copper, electric pushes, and casement handles, the latter very effective in regard both to appearance and action. Front door furniture, sash fasteners and axle pulleys are also included, and beaten copper or brass cabinet fittings. Attention should also be given to the ball-bearing runners for sliding doors, various forms of which are illustrated and described in the catalogue. Among the contents of the catalogue are also a variety of fan-light openers, among which is the "Lockerbie" rod opener for working a vertical series of fanlights, and the "Victoria" gearing for opening horizontal and vertical series of lights. The decorative grate designs in beaten copper and in inlaid

wood are admirable, and quite above the average style of design seen in catalogues.

Messrs. J. Hodson & Son (Nottingham) send us a pamphlet in recommendation of Killer's Hopton Wood Stone, in which they deal, containing photographs of various buildings carried out by them in this stone, a beautiful material, which has been used in various important buildings in this country. The following particulars given in the pamphlet may be of interest :—

"The quarries produce three qualities of stone known as the white bed, grey bed, and dark bed. The white bed is used for monumental purposes. The grey bed is used for best finished and polished work, and has been used in the buildings mentioned in the list ; it will take a polish equal to marble or granite, and can be supplied at less cost than either; it is suitable for exterior or interior use, and can be seen with good effect in the Imperial Institute and other buildings. The dark bed is the hardest, and is now put on the market for all descriptions of general masonry requiring a hard and durable stone, giving a clean, impervious surface ; the crushing stress, as tested by Messrs. Kirkaldy, is 810 tons per cubic foot."

Messrs. Ham, Baker, & Co. send us illustrations and descriptions of their patent water waste preventer for street fountains or pillars, which enables any required quantity of water to be drawn, but prevents the possibility of the water being left running. The apparatus consists of a tap connected to a cylinder, holding a known quantity (say one gallon). When the handle of the tap is turned the contents of the cylinder are discharged through the outlet of the tap. The water then stops automatically, and no more will flow until the handle of the tap is reversed, when a similar quantity is drawn, again stopping automatically, this quantity being the maximum obtainable with one turn of the handle. The principle on which it works is shown in the accompanying diagram. Water from the main



Messrs. Ham, Baker, & Co.'s Patent Water-waste Preventer for Street Fountains, &c.

enters at A 1, flows through the port in the plug tap A to pipe P into the cylinder B, forcing piston B 1 to the opposite end of the cylinder, and at the same time expelling the contents of this cylinder through pipe P 1 to the outlet of plug tap A 4. When the piston B 1 arrives at the end of its travel the water ceases to flow.

Messrs. Davenport & Coward, constructional engineers, send us a leaflet containing illustrations of some of their special forms of fire-resisting construction. These include a good form of suspended ceiling, in which ceiling bars, protected by concrete, are suspended by a special form of clip to the flanges of the main rolled-iron girders. They also show concrete floors without joists for spans up to 12 ft., of concrete with a "tension bond" embedded. Messrs. Davenport & Coward are also licencees for the expanded metal system of channel-arch flooring for warehouses, and the employment of expanded metal and cement for interior and exterior walls.

The Patent Vulcanite Roofing and Asphalte Company sends us a catalogue which consists principally of photographs of buildings in which their material has been employed—a form of illustration which is not very much to the point. At the end of the book, however, are some sections showing the application of the material, and especially drawing attention to the saving of room in the upper portion of a house owing to the capability of the material (alternating with asphalt) being laid as a flat roof instead of with the slope necessary for tiles or slate. The vulcanite roof has, we believe, stood very strong tests in regard to fire-resisting quality.

Messrs. Colledge & Bridgen (Wolverhampton) send us an illustration and description of their "New Century" patent casement stay, of

which we append an illustration. The object, in the words of the patentees, is "to dispense with the weak double joint."

Messrs. Neatby Evans & Co., a new firm of decorative artists in Percy-street, W., send us a pamphlet circular in true "up-to-date" style, printed on grocers' wrapping-paper with uncut edges, with illustrations in thick lines and little blots of colour. We should surmise from what we gather from the illustrations that their work will probably have a good deal of character—the sketch for a clock for instance is very original—and we may have more to say about their work on another occasion ; but we regard this kind of make-up of a catalogue as a mere artistic pose, a fashion of the moment, in which there is no merit but eccentricity.

Mrs. Starkie Gardner sends a pamphlet describing and illustrating some works in metal made by her. These include a special lever lock of which the section is given; and some examples of decorative metal-work ; hand-beaten work, of which the same design is not repeated, unless by special desire. This is, of course, entirely in the right direction.

Under the title "The Art of Illustrating" Mr. F. Catling sends a small portfolio of examples of engravings and reproductions made by him. They include tone blocks and line process blocks, and show very good work.

Messrs. Claughton Bros. send us illustrated sheets showing their "Niagara" siphon cistern, which is a lead-lined cistern made in polished American oak, thus presenting a neat appearance without the necessity of casing. They send also a large sheet of priced illustrations of their cast and wrought lead sanitary work, including patent oval traps and siphon traps, down pipes with cast branches, spout heads and connexions, cast lead ornaments, &c.

Messrs. Jones & Campbell (Larbert) send us a small illustrated catalogue of their ranges and mantels.

APPOINTMENT.—Mr. W. D. Caröe, F.S.A., architect to the Ecclesiastical Commissioners, has been appointed architect to the Dean and Chapter of Canterbury, in place of the late Sir Arthur Blomfield.

BOOKS RECEIVED.

ENGINEERING COST ACCOUNTS. By Francis G. Burton. Second edition, 3s. (The Technical Publishing Company.)

THE LAND AND HOUSE PROPERTY YEAR-BOOK FOR 1901. (*Estates Gazette* Office.)

Correspondence.

To the Editor of THE BUILDER.

THE DATE OF THE PANTHEON.

SIR,—Would you be obliging enough to correct an error of your compositor? In column 3, page 130, of my second Royal Academy Lecture he left out an "8," putting "13 A.D." instead of "138" in the date of the building of the Pantheon at Rome.

My attention was drawn to it by one of my foreign correspondents, who asked me if I dated its erection from Agrippa, who died in 12 A.D. He supposed it showed a want of agreement with Mr. Chedanne's researches.

G. AITCHISON.

BUILDERS' FOREMEN AND TRADES-UNIONS.

SIR,—Having seen so many attacks on builders' foremen who are members of a trade union, the latest being those made at the dinner of the Provident Institution of Foremen and Clerks of Works, would you kindly give me (as a foreman belonging to a trade-union) space for a few remarks on the other side of the question ?

In the first place builders' foremen, unlike poets, are made, not born (I notice one of the speakers at the above dinner is in favour of the evolution) ; the majority of them have served their time at a trade, and worked for a certain period at it ; during that time, if they have troubled to think about it, they have perceived the benefits of combination ; for benefits there must be, or why the masters' associations ? When they have obtained a foremanship, the need for belonging to a workmen's combination no longer exists ; but they are still men, most probably married, with a family, and like all men subject to sickness ; *that* is the reason they still belong to the union. The remarks made at the above dinner as to serving two masters are, I think, beside the question, as they ignore the friendly society side of it ; the speakers should, as a matter of justice, recognise that a trade-union is not formed for the sole purpose of fighting the masters. If instead of calling the union hard names at public dinners the masters were to try and perfect the scheme proposed some time ago, whereby the foremen could have a trade benefit society independent of the workmen's unions and auxiliary to the friendly societies, they would confer a lasting good, both to themselves and their foremen. As far as I am aware the existing societies for foremen do not include any provision for regular sick-pay.

A BUILDER'S FOREMAN
BELONGING TO A TRADE-UNION.

"INDIGENT BLIND SCHOOL."

SIR,—In your "Notes" of last week's *Builder* we see that we are credited with the appointment of honorary architects and surveyors to the above charitable institution.

This is not so, as Mr. Roumieu was only appointed honorary surveyor. He visited and reported on the site chosen at Leatherhead, but the designing and carrying out of the new schools has been placed, by the Committee, in the hands of another architect. ROUMIEU & AITCHISON.

THE STUDENTS' COLUMN.—In consequence of the pressure of other matter, our Students' Column article ("Sanitary Fittings and Plumbing") is held over until next week.

THE PEABODY FUND.—In the thirty-sixth annual report of the Peabody Fund, for the year 1900, it is stated that on December 14 last her late Majesty Queen Victoria granted to the Governors, and their successors in office, a Royal charter incorporating them under the name and style of "The Governors of the Peabody Donation Fund." In pursuance of the directions contained in the charter, all the estates and property belonging to the Trusts will now be vested in the Corporation by name, and arrangements for this purpose are in progress. At the end of the year the Governors had provided for the artisan and labouring poor of London 11,439 rooms, besides bathrooms, laundries, and lavatories. These rooms comprised 5,159 separate dwellings, viz., 100 of four rooms, 1,770 of three rooms, 2,440 of two rooms, and 849 of one room. On the Herne Hill Estate twelve blocks of buildings of forty rooms each, besides laundries, lavatories, &c., are now in course of construction, and, it is hoped, will be ready for occupation by the end of the year.

GENERAL BUILDING NEWS.

COUNTY SCHOOL, BARRY, GLAMORGANSHIRE.—Barry Intermediate School, which has undergone considerable enlargement, has just been reopened. The school buildings are erected on an elevated site near the Buttrills at Barry, and as now completed provide accommodation for 144 boys and eighty girls. The first school was completed in 1895, and in 1897 there were added two new ordinary class-rooms, new laboratories, and cookery kitchen. The work just completed includes the enlargement of the assemby-hall, the building of one new ordinary classroom for boys, and of new chemical and physical laboratories, new science lecture-room and art studio. The old workshop has been converted into two cycle stores, and the workshop stands in place of the old chemical laboratory, and the rooms formerly providing a physical laboratory and balance-room have been converted into a gymnasium. The entrances and cloakrooms are separate for boys and girls, and are placed at the west and east ends of the main building respectively. There are now four ordinary class-rooms, and a large assembly-hall in which when required four classes can be accommodated. The old building was a one-story building, but in this last contract the roof was taken off the centre part and a floor put over the present assembly-hall, on which are the new laboratories, lecture and balance and art rooms. The old art studio has been converted into a staircase hall and a stone staircase has been erected. The main corridor on the ground floor runs through from end to end. All the rooms are entered from the corridors, and the classes are so arranged as to have left-hand light, and chiefly north light. The cloak-rooms have been considerably enlarged, and the accommodation formerly used by the caretaker has had to be taken in for teachers' rooms and stores. The head and assistant teachers have private sitting-rooms. In a new detached building are now provided dining-halls both for boys and girls, with pantries, &c., and attached to them is the caretaker's house with direct connexion with each hall. The floor of the assembly-hall and of the first floor rooms are laid with wood blocks by Mr. Ebner, of London, and the corridors and cloak-rooms have been refloored in tiles. The first floor is fireproof, formed of steel joists and girders, and concrete, by Messrs. Homan & Rodgers, of Manchester. The contract for the alterations and additions just completed has been carried out by Mr. Alban Richards, of Barry; Mr. W. Fry, of Cardiff, acting as clerk of works. Mr. W. Britton, of Barry, has in hand now a contract for new boundary walls and other work to the new recreation grounds. The cost of the present alterations and additions to the school has been 3,260*l.*, and the price for the other work will add another 818*l.* The architect is Mr. W. H. Dashwood Caple, of Cardiff.

DUNOON GRAMMAR SCHOOL, ARGYLLSHIRE.—This building has just been opened by Mr. D. N. Nicol. As now completed, the whole building is of two stories. There are the usual classrooms and, in addition, an art room, lecture-room, chemical laboratory, physical laboratory, cookery-room, music-room, rector's room, lady teachers' room, and separate cloakrooms for boys and girls and infants. Exclusive of the science and art rooms, there is accommodation for 820 scholars. The architect was Mr. Wm. Fraser.

PROPOSED ENLARGEMENT OF MIDDLESBROUGH ASYLUM.—Mr. A. A. G. Malet, Local Government Board Inspector, held an inquiry at the Municipal Buildings, Middlesbrough, on the 27th ult., respecting the application of the Town Council for permission to borrow 23,963*l.* for purposes of the Middlesbrough Borough Lunatic Asylum. The proposed works comprise additional blocks for 160 patients, night nurses' quarters, and staff cottages. The scheme was explained in detail by the architect, Mr. A. J. Wood, of London.

ELECTRIC LIGHTING NEWS.

ELECTRICITY WORKS, DEVONPORT.—The foundation stone of the Devonport Corporation Electricity works, which are in course of erection in Newport-street, Stonehouse, was laid on the 21st ult. Mr. C. Furness is the engineer, and Mr. A. N. Coles the builder.

ELECTRIC LIGHT, FULHAM.—The inauguration of the electric light in Fulham took place on the 21st ult. The generating station is situated near Wandsworth Bridge. There is a refuse destructor in connexion with the scheme. Mr. F. H. Medhurst was the engineer, and the plant was supplied by the General Electric Company.

ELECTRIC LIGHTING, SUNDERLAND. — On the 21st ult. Mr. M. K. North, an Inspector to the Local Government Board, held an inquiry at the Town Hall, Sunderland, into an application by the Corporation for sanction to borrow 73,035*l.* for purposes of electric lighting. The scheme was explained by Mr. J. F. C. Snell, the Corporation Electrical Engineer.

ELECTRIC LIGHTING, NEWCASTLE.—The Newcastle Corporation having applied to the Local Government Board for sanction to borrow 10,000*l.* under the Newcastle-on-Tyne Tramways and Improvement Act, 1899, Mr. A. A. G. Malet, A.M.Inst.C.E., held an inquiry at the Town Hall, on the 26th ult., into the subject matter of the application. Mr. Le Rossignol, the Resident Electrical Engineer, described the scheme, which is for lighting the principal thoroughfares.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, UNITED FREE CHURCH, ABOYNE, ABERDEENSHIRE.—The circular window behind the pulpit in the east end of this church has been replaced by one of stained glass. The work was executed by Messrs. Swaine, Bourne, & Sons, of Birmingham, under the supervision of Mr. George Coutts, of Aberdeen.

MEMORIAL WINDOWS, WINCHCOMBE CHURCH, GLOUCESTERSHIRE.—Three stained glass windows have been placed in the north aisle of Winchcombe parish church, in memory of the late Mrs. Dent, of Sudeley Castle. The windows were the work of Messrs. Powell, of Whitefriars.

FOREIGN.

FRANCE.—The Municipality of Paris has renewed its negotiations with the State in reference to the long-talked-of subject of the lighting of the Tuileries gardens with electricity.——The Government has established a French School of Oriental Art, on the model of the existing French schools at Rome and Athens. It will have for its primary object the archæological exploration of the Indo-China peninsula and the neighbouring regions.——M. Cazin is at work on the friezes, after sketches left by Puvis de Chavannes, which were intended to crown the frescoes executed by the deceased artist in the Panthéon.——In the small square of St. Germain des Prés, at Paris, there has been set up the portico in ceramic ware which recently stood on the Esplanade des Invalides, and which was carried out at the Sèvres manufactory. In the centre of the portico is an alto-relief figure, symbolising "La Céramique," which has been modelled by M. Coutan. In the opposite square are being erected the fragments of a Gothic cloister which was formerly part of the ancient Bibliothèque des Benedictins, and was built by Pierre de Montereau.——Parliament will be shortly occupied with a scheme for the improvement of the canal from the Escaut to the Saône, and of one or two other connecting canals, and also with the general question of the navigable character of the Loire between Nantes and Angers; also the improvement of the basins and ports of Marseilles, Bordeaux, Havre, Rouen, Dieppe, Saint-Nazaire, Bayonne, and Cette.——M. Injalbert's group of "Faunesses et Satyres," which, as before mentioned, was refused by the town of Montpellier as immoral, is now to be offered to Paris.——The municipality of Reims intend to place in their museum the statue of Louis XV. by Pigalle, now on the Place Royale, and which has already suffered injury at the hands of Republican enthusiasts. The statue of Colbert will be erected in its place.——M. Girault, the architect of the Petit Palais, has been appointed Architect to the Palace of Fontainebleau, in place of M. Boitte.——M. Paul Charbonnier, of Nancy, has been appointed architect in charge of "Monumentes Historiques" for the Department of Meurthe-et-Moselle, in place of the late M. Schuler.——M. Tropey-Bailly has been appointed Architect of the Eighth "Section of Architecture" of the city of Paris, comprising the Ninth and Seventeenth Arrondissements, in place of M. Sauffroy, retired. M. Refol has been appointed Architect to the Second Section (Third and Eleventh Arrondisements).——M. Decraix, architect, has been commissioned to erect a new Hôtel de Ville at Calais at an estimated cost of 750,000 fr.; and the Municipality of the same town has commissioned M. Constant, engineer, to build a new theatre at a cost of over a million francs.

AUSTRALASIA.—A conference of Australian architects, held in Sydney, has decided to form a Federal Institute of Architects. Whilst recognising the value of the R.I.B.A. examinations, and strongly urging young Australian architects to qualify both for the Associateship and Fellowship of the Institute, the general feeling is that architects at the Antipodes are "too far away from the old country to reap any special advantages therefrom, and if affiliated lose our individuality, and to a certain extent our independence, and sink to the level of a small provincial society in England." "An Australian Institute should occupy the same position in relation to the parent society that the colonies occupy towards the mother country;" such is the opinion in Australia. It is proposed that the Federal Institute should be independent of, but work in harmony generally, with architects in other parts of the world for the welfare of the whole profession. It is held that the passing of the Royal Institute of British Architects' examination by Australian architects should be regarded in the same light as colonial medical men look upon the taking of an English degree—viz., as an extra qualification, giving them a higher status in their profession.——The New Zealand Government has invited competitive designs for new Houses of Parliament; the buildings are estimated to cost 100,000*l.* The first, second, and third premiated designs are to be awarded 500*l.*, 200*l.*, and 100*l.* respectively.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Johnson & Phillips, electric cable manufacturers, &c., at Old Charlton, have opened a West End depot at 37, King-street, Covent Garden.——A company has been formed, under the title of "W. Oliver Sons & Howard, Limited," for the purpose of acquiring and combining the business of Messrs. W. Oliver & Sons, of 120, Bunhill-row (wainscot, mahogany, and general timber merchants), and the hardwood portion of the business of Messrs. W. W. Howard Bros. & Co., of 109, Fenchurch-street. The temporary office of the company is at the latter address, and the registered office at 120, Bunhill-row. (See advertisement in this week's issue.)

CARPENTERS' HALL LECTURES.—The series of five Thursday Evening Lectures at Carpenters' Hall commenced on the 21st ult., with a lecture by Mr. H. H. Statham on the Architecture of the Paris Exhibition. He said the architectural features of that exhibition had afforded a remarkable evidence of the architectural genius and power of impersonation of the French, and the temporary architecture was of interest in another sense; it suggested a special problem, for temporary architecture need not have, and indeed ougnt not to have, the same qualities as permanent or monumental architecture. With a plan exhibited on the screen the lecturer sketched the history of the site, and the gradual extension of the exhibition ground in each exhibition since that of 1856, when the Palais de l'Industrie was built. He then described in detail the new bridge and the two art palaces on the Champs-Elysées, the beautiful permanent features which the Exhibition had left; a number of photographs of these and a plan of the smaller art-palace were shown with the lantern. They would next take the temporary buildings, of which a number of photographs were shown, commencing with the entrance gate from the Place de la Concorde; then taking the buildings of the Esplanade des Invalides, going from north to south; then some of those of the Champ de Mars, and concluding by a series showing the buildings on the right and left banks of the river, ending with the Italian Palace which formed the eastward termination of the Rue des Nations.—On the 28th ult. the second of the course of lectures was delivered by Mr. H. C. Richards, M.P., K.C. The subject was "Old London," and it is an encouraging sign for those who are endeavouring to prevent the obliteration of the existing remnants of old London, that the lecture attracted a large audience. Antiquaries did not perhaps glean many new facts from the lecture, but an illustrated discourse by so able and enthusiastic an antiquary as Mr. Richards will always be listened to with interest. The lecturer stated that Cornhill was the site of the first Roman settlement in London, and that here was built the first Christian church of London. Cheapside was not so old, but its history as an inhabited area could, nevertheless, be traced for a thousand years. The fact that William the Conqueror and the citizens of London so readily came to terms, to the great advantage of London property, was ascribed by the lecturer to the circumstance that the Bishop of London at that time was also a Norman, and that for some time before the Conquest Norman influence had become a power in the city. Mr. Richards referred in caustic terms to the disappearance of certain ancient bequests, and the callousness of the Charity Commissioners on matters relating to old customs and ceremonies, but gave due credit to the London County Council for its action in appointing a committee to keep a watch upon all places of historic interest within the county.

WHAT IS A "CURTILAGE."—Under this heading the following appears in the last issue of the *Sanitary Chronicles of St. Marylebone* (monthly):—"The word 'drain' under the Metropolis Management Acts is defined to mean and include any drain of and used for the drainage of one building only 'or premises within the same curtilage,' it also includes drains for draining any block of buildings by a combined operation under the order of a Local Authority. The word 'sewer' is only defined in the statute by a process of exclusion, pipes for draining premises must apparently be either sewers or drains, and if they are not drains then they are 'sewers.' It is hardly necessary to observe that sewers are under the jurisdiction of Local Authorities, drains are private matters. Golden Horse Yard consists of a group of stables with living-rooms over them, enclosing a yard approached from Taunton-mews, there is also a way into the yard through two houses in Linhope-street, the back doors of these houses opening on to the yard. The yard is entirely enclosed by the stables and the two houses in Linhope-street. The drainage of the stables and houses was found to be defective, and a notice from the Council duly served upon the owners to remedy the defect. Thereupon the owners sought to cast the responsibility on the Council, arguing that the drain in this confessedly private yard was 'a sewer.' The owners were informed by the officers of the Sanitary Department that the yard was 'a curtilage,' and the stables, &c., were all situated in the same curtilage, and, therefore, the various conduits were private drains and not sewers. This question on summons was heard before the

stipendiary and ably argued on both sides. The solicitor to the Council relied upon certain leading cases and the facts to prove the yard was a curtilage to the stables generally. On the other side it was contended that the houses being more of the nature of stables than houses, this common yard could not be said to be the curtilage of any one of them or the curtilage of all of them, and that the idea of curtilage was insuperably connected with that of dwelling-house and could not be applied to stables. The stipendiary adopted this view, and gave his judgment in favour of the defendants, but granted a 'case.'"

FIND OF POTTERY.—The Dover correspondent of the *Morning Advertiser* says that one of the finest collections of ancient Roman pottery ever found in Kent has been discovered quite close to Walmer Castle, the Cinque Ports residence of Lord Salisbury. The discovery was made by Messrs. Mawson, landscape gardeners, of Windermere, while excavating at Walmer Lodge. Altogether the collection comprises about forty pieces. They have been removed to one of the buildings adjoining the grounds, where they are now being privately exhibited. According to archæological authorities who have seen them some of the specimens are very valuable. Some of the pieces of pottery are in a remarkable state of preservation.

IMPROVEMENT SCHEME, LEEDS. — A Local Government Board inquiry was opened by Mr. Robert Bicknell, M.Inst.C.E., on the 1st inst., in the Council Chamber at the Leeds Town Hall, with reference to the scheme of the Leeds Corporation for clearing the vicinity of Quarry Hill of all its back alleys, dark courts, and insanitary property. The area proposed to be dealt with is 311,318 square yards in extent. In this area are 2,164 dwelling-houses, 177 joint dwelling-houses and shops, five lodging-houses, forty-eight public-houses, one board-school, one Roman Catholic school, one church, three chapels, four Jewish synagogues, four Sunday-schools, and 363 warehouses, mills, factories, &c. The miscellaneous buildings, it appears, include ten bakeries, four clubs, two cow-houses, three slaughter-houses, one herring-curing establishment, one sausage-skin factory, one tripe factory, and one piggery. The carrying-out of the scheme will disturb between 4,000 and 5,000 people, and, according to the City Engineer, will cost the ratepayers of Leeds 298,034*l.* The Corporation will have to pay 450,567*l.* for property, and 77,467*l.* for alterations to, and the formation of, streets—a total of 523,034*l.* From this sum is deducted 225,000*l.*, as the amount the Corporation is likely to obtain for surplus land.

LAMBETH COUNCIL AND TENDERS FOR JARRAH.—At a meeting of the Lambeth Borough Council held on the 21st ult. at the Town Hall, Kennington, the General Purposes Committee submitted the following list of tenders received for the supply of 3,000 loads of jarrah wood for paving purposes during the ensuing summer:—Jarrah Timber and Wood Paving Corporation (as required), 7*l.* 12s. 6d. per load; Churchill & Son (May, June, and July), 7*l.* 3s. per load; W. Griffiths & Co. (May, June, and July), 7*l.* 2s. 6d. per load; Millars' Karri and Jarrah (May, June, and July), 7*l.* per load; Jarrahdale Jarrah Forests and Railways, Limited (May, June, and July), 7*l.* per load; A. & F. Manuelle (as per specification), 6*l.* 19s. 6d. per load; Acme Wood Flooring Company, Limited (May, June, and July), 6*l.* 16s. 3d. per load. The committee stated that with the tender from the Jarrahdale Jarrah Company was enclosed a letter from Mr. F. Chapman, who stated that:—"The freight market has been ruling rather high, but I would be quite prepared to do what I did on a previous occasion with your vestry, viz., to give you any benefit in the fall of the freight market." In commenting upon this letter the committee stated that although the tender appeared on the face of it to be 3s. 9d. per load in excess of the lowest tender, it was possible that the proposal as to freight might vary to that or even a greater extent. In addition the company had given every satisfaction in previous deliveries, and a considerable benefit was obtained from the saving on freight. The committee, therefore, recommended the Council to accept the tender of the Jarrahdale Jarrah Forests and Railways, Ltd., for 3,000 loads of hardwood at 7*l.* per load subject to the Council receiving any benefit in the fall of the freight market. Councillor Thwaite, as an amendment, proposed the acceptance of the tender of the Acme Wood Flooring Co. at 6*l.* 16s. 3d. per load. He said that he could not understand the committee's recommendation when, by accepting the lowest tender, the Council would save 562*l.* Councillor Hubbard seconded the amendment, which, after further discussion, was carried. It was then agreed to unanimously as a substantive motion, and the contract was thus awarded to the Acme Wood Flooring Co.

BRISTOL ASSOCIATION OF CLERKS OF WORKS.—The annual dinner of the Bristol Clerks of Works and Builders' Foremen's Association was held on Saturday night at the Royal Hotel. The chair was taken by Mr. Frank W. Wills, President of the Bristol Society of Architects, and he was supported by Councillor Lee, Mr. W. J. Steele, Deputy City Engineer; Mr. H. Dare Bryan, Hon. Sec., Bristol Society of Architects; Mr. A. Krauss, President of the National Association of Master Builders of Great Britain; Mr. G. Humphreys, President of the Bristol Association of Master Builders, and others. In the course of the evening Mr. W. Kidwell proposed "Trade and Commerce," which was acknowledged by Councillor Lee, who quoted figures showing that between the years 1800 and 1900 the population of Bristol had increased eight-fold, the tonnage of the port in the last sixty-seven years fifteen times, and the rateable value twelve times. Mr. F. N. Cowlin proposed the toast of "The Architects," and Mr. H. Dare Bryan having responded, Mr. W. Hollyman proposed "The Master Builders." Mr. Krauss, in responding to this toast, urged upon the hosts of the evening to adopt, as their brethren in the north had, their own scheme for accidents, sick and annuity provision, as well as life policies. In the north the assistance kindly and willingly rendered by the Master Builders, plus the contributions of the members, had already put this on a sound and satisfactory footing. He pointed out to the members that they could not serve two masters, the men's trade union and the builders, and remarked that they would be benefited by forming their association into a benefit society, so that those members who now belong to the Trades Union might be free from the men's union and at the same time lose none of the benefits. The Chairman proposed "The Bristol Association of Clerks of Works and Builders' Foremen," and congratulated his hearers on the progress the Association had made.

FIRE PREVENTION EXHIBITION AT THE AGRICULTURAL HALL. — A meeting of the commercial section of the British Fire Prevention Committee was held on the 6th inst., Mr. F. R. Farrow presiding, when most of the firms represented took the opportunity of announcing their intention of participating in the Fire Prevention section of the Building Trades' Exhibition. Among the firms to whom space has already been allotted are the Asbestos and Asbestic Co., Ltd.; Messrs. D. Anderson & Son; The British Luxfer Prism Syndicate, Ltd.; Mr. Buggé; The British Uralite Co., Ltd.; Messrs. Broadbent & Co., Ltd.; Messrs. Clark, Bunnett, & Co., Ltd.; The Crittall Manufacturing Co.; The Conduit and Insulation Co., Ltd.; The Columbian Fireproofing Co.; Messrs. Green & Co.; Messrs. Hobbs, Hart, & Co.; Mr. F. Jones; The Mural and Decorations Syndicate, Ltd.; The New Expanded Metal Co.; The Non-Flammable Wood Co.; Messrs. Pilkington Bros.; Messrs. Potter & Co., Ltd.; Messrs. G. A. Williams & Sons. Details as to classification were discussed with Mr. Hammond, Chairman of the Exhibition Sub-Committee, and it was arranged that with regard to firms that had not yet definitely applied, application should be made before March 15 to the offices of the Committee, 1, Waterloo-place, Pall-mall.

HULL MASTER BUILDERS' FEDERATION.—The members of the Hull Branch of the Yorkshire Federation of Building Trades Employers held their annual dinner at the Grosvenor Hotel, Hull, on the 21st ult. The President (Mr. C. Hebblewhite) presided. The health of the King and Queen having been honoured, Mr. E. Good (Vice-President) proposed "The Navy, Army, and Auxiliary Forces," to which Mr. W. S. Walker briefly responded. The toast of "Success to the Hull Federation of Building Trades Employers" was proposed by Mr. Hewitson. He said that during the past few years they had been passing through uncertain and irregular trade. He hoped that all disputes between master and man had been settled for some time to come, and that they might have a quiet and prosperous time. He hoped that the power of that organisation would always be used in the direction of settling disputes in an amicable manner.—The Chairman, in responding, said that there was not one in that room that had the idea of oppressing their workmen. There were times when difficulties did and would always arise, and some fresh means should be adopted to settle those difficulties. He assured them that if the demands made upon them in the future were reasonable, they would be met in a reasonable spirit. Labour during the past year or two had cost 33 per cent. more than it did a few years ago, and that was a state of affairs the builder would have to reckon with. He was bound to confess that in hundreds of instances the masters did not get a fair return for the money they paid. He defied any man on the opposite side to say that they did if they knew anything about practical work. With all the latest machinery there were hundreds of instances where the same amount of work was not produced as when he had to take the plane and saw in his own hands. He hoped, however, that in the future they would be able to adjust matters on more peaceable lines.—Mr. J. Watson submitted the toast of the "National and Federated Branches and Kindred Associations of the Building Trade." After speaking of the growing strength of the various branches of the trade, he went on to say that with prices fluctuating as they had been lately, it was most difficult for the builders to make estimates. Prices had gone up by leaps and bounds. Within the last six or seven years the cost of labour and materials had gone up 25 per cent. in Hull. He very much doubted whether there could be any building of a speculative nature that could show a reasonable return at the present prices. Mr. Longden, in responding, said it was always a rule that as wages went up a penny per hour, the work went down twopence per hour. Messrs. G. England and J. Biggin also briefly responded. Mr. F. Beilby gave "The City and Trade of Hull," and Mr. Councillor Scott, J.P., briefly responded. Councillor Scott, J.P., gave "The Architects and Surveyors," to which Messrs. Walker and W. E. Barry responded. Mr. J. Townley proposed "The Visitors," which was acknowledged by Messrs. Rhodes and Earnshaw.——The Executive of the Yorkshire Building Trades Employers' Federation met at the Builders' Exchange, Posterngate, on the 21st ult. The attendance, however, was not large owing to the National Association's meeting in London, at which many of the Yorkshire delegates were engaged. The Yorkshire President (Mr. James Longden, Sheffield) occupied the chair, and was supported by representatives from Sheffield, Barnsley, Bridlington, Halifax, Huddersfield, &c. The delegates appointed to carry out organising work during the past month, reported satisfactory progress, and said that further meetings had been duly arranged. This being the annual executive meeting the secretary (Mr. Hanson, Halifax) was unanimously re-elected to that position, and Mr. W. R. Thompson (Dewsbury) was re-elected to the treasurership.

CARFAX IMPROVEMENT, OXFORD. — An inquiry into an application by the Oxford Corporation to the Local Government Board to issue a provisional order to empower the Council to put in force, with reference to certain lands required by them for the purpose of widening and improving Cornmarket-street, the powers of the Land Clauses Acts, with respect to the purchase and taking of land otherwise than by agreement, was held at the Municipal Buildings, Oxford, recently, by Mr. H. H. Law, an Inspector to the Board. It was stated that the premises proposed to be purchased were No. 1, Cornmarket-street, the owners being the trustees of the St. Aldate Parochial Charities. Certain premises in the street having been pulled down, the Corporation had made a new building line, and this necessitated the pulling down of the premises at No. 1, which were known as the Creamery. The owners of the property had fixed the value at 5,000*l.* Evidence was given by the City Engineer, Mr. W. H. White. After the inquiry the premises were visited by the Inspector.

INCORPORATED SOCIETY FOR PROMOTING THE BUILDING OF CHURCHES AND CHAPELS. — This Society held its usual monthly meeting on Thursday, 21st of February, at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. The first business was the reading and passing of a loyal address to the King. Grants of money were then made in aid of the following objects viz.: Building the first portion of the proposed new church of the Ascension, Victoria Docks, Essex (Felsted School Mission), 120*l.*; rebuilding on a new site the Church of St. James, Grove, near Wantage, 50*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Radclive-cum-Chackmore, St. John the Evangelist, near Buckingham, 30*l.*; Stourton Caundle Parish Church, near Sherborne, Dorset, 25*l.*; Stow Longa, St. Botolph, near St. Neot's Huntingdon, 25*l.*; Wetley Rocks, St. John, near Stoke-on-Trent, 20*l.* The following grants were also paid for works completed: Denaby Main, All Saints, near Rotherham, York, 55*l.*; Huddington, St. Michael and All Angels, Droitwich, Worcester, 30*l.*; Erchfont, St. Michael and All Angels, near Devizes, Wilts, 20*l.*; New Brighton, Emmanuel, Cheshire, 120*l.*; Horley, St. Bartholomew, Surrey, 60*l.*; Crofton Park, St. Hilda, Catford, Kent, 40*l.*; and Walthamstow, St. Paul, Essex, 40*l.* In addition to this the sum of 295*l.* was paid towards the repairs of nineteen churches from trust funds held by the the Society. The Annual General Court of the Society will be held at 3 p.m. on Friday, the 17th May, at the Church House, Dean's-yard, Westminster, when the chair will be taken by the Archbishop of Canterbury, President of the Society.

WASHED SAND.—We have received a sample of washed pit sand from Messrs. Heather, Bailey, & Co., Limited, Commercial-road, Lambeth, respecting which they remark that the material comes from Erith, and that they have recently erected a plant to deal with it. The sand is said to be reasonable in price, and to be beneficial to numbers of builders who are at present obliged to wash their sand in the old way by hand. We find, on examining the material, that it is of medium-grain, slightly ferruginous, and composed almost exclusively of fragments of quartz and flint. The sand grains are, for the most part, sub-angular, and are of varying size; the largest, which are few in number, might be termed fine grit, and these are, nearly all, of white flint. It is certainly a good sample of builders' sand, free from shell fragments, and has been washed exceedingly clean.

CAPITAL AND LABOUR.

THE QUARRYMEN'S STRIKE IN NORTH DERBYSHIRE.—The strike of quarrymen in North Derbyshire, which has existed several weeks, has come to an end. As the result of a conference held at Buxton, the 1,500 men who refused to "sign on" under the new conditions have resumed work, the agreement being that an engagement in the future be terminable by a month's notice on either side.

KIRKCALDY BUILDING TRADE. — The operative masons have received notice from the Masters' Association of a reduction of wages from 8½d. to 8d. per hour, commencing at the end of May. The operatives have decided not to accept the reduction, holding that the state of trade does not warrant it, and seeing also that a halfpenny had been taken off last year. Operative joiners have received notice of a reduction from 8d. to 7½d. They have decided against the reduction. Bricklayers at most of the buildings in progress in the district have been notified of a reduction of a halfpenny per hour, from 9½d. to 9d.

ABERDEEN PAINTERS' STRIKE.—The *Aberdeen Free Press* states that at a meeting of the members of the Aberdeen branch of the Scottish Amalgamated Society of House and Ship Painters, held in the Trades Hall on the 27th ult. for the purpose of considering what action the men were to take in the dispute which has been going on for some time, after a long discussion it was unanimously agreed to accept the finding of the masters and not contest the question further. The point in dispute was that rule 6 should be altered to read as follows:—"That the men shall be at a shop job or radius at the hour of commencing work, the radius to be one and a half miles, Union Bridge as a centre." The masters at first wished the radius, which was formerly one mile, to be doubled. The men objected and the masters agreed to make it one and a half miles, and to this the men have agreed. Other points were disputed, but these were mutually agreed to. The men asked that instead of 5s. extra per week being allowed for country work the figure should be 6s. The masters requested that country working hours should be regulated by daylight and other circumstances, but gave way, and agreed that in country work there would not be less than seven hours per day, and if more than eight that extra money would be paid.

NORWICH BUILDING TRADE PROSPECTS.—The strike on the part of the Norwich bricklayers still continues, and there is no immediate prospect of a settlement. What makes the outlook gloomier still is that various other operative branches of the building trade are making a move in favour of higher wages; and that even if the bricklayers get back to work the paralysis of the building trade promises to continue. We learn that the Norwich Master Builders' Association are in receipt of no fewer than three further demands. The Amalgamated Society of Carpenters have given notice for an advance of ½d. an hour and a proportionate increase for overtime, to take effect on June 1, 1901. The Navvies, Builders' Labourers, and General Labourers' Union are asking also for ½d. advance, to take effect on June 1, and the Amalgamated Society of House Decorators and Painters demand an increase of 1½d. an hour, the present rate being 6d., and various alterations of the rules. These latter would, if granted, bring about a reduction of working hours, and would transfer to the painting trade all whitewashing and distempering done with hair brushes. The master builders have not yet fixed a meeting at which these demands will be discussed. —*Eastern Daily Press.*

LEGAL.

BUILDING DISPUTE AT HARROGATE.

THE case of the Mayor, &c., of Harrogate *v.* Holmes came before Mr. Justice Cozens-Hardy in the Chancery Division last week, concluding on the 28th ult., an action brought by the Mayor, Aldermen, and Burgesses of the Borough of Harrogate against Mr. William Holmes, of 1, Valley-drive, Harrogate. The plaintiffs asked for an injunction to restrain the defendant, his contractor, builders, agents, and workmen from erecting or permitting any buildings already erected by defendant to remain in Valley-drive and Valley-mount, in the Borough of Harrogate in such a manner as to be contrary to the Harrogate Corporation Act of 1893 and the by-laws in force within the borough, or otherwise than in accordance with plans deposited by the defendant with the plaintiffs pursuant to the by-laws and approved by the plaintiffs. The Corporation also asked for a declaration that they were entitled to remove, alter, pull down, or otherwise deal with the works constructed by the defendant contrary to the provisions of the Act of 1893.

Mr. Micklem, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Eve, K.C., and Mr. Perks represented the defendant.

Mr. Micklem said that the action was brought by the Corporation of Harrogate to restrain the infringement of its building by-laws. Harrogate was incorporated by charter in 1884. Before the Commissioners had been appointed to carry out the provisions of the Harrogate Improvement Act of 1841 and they had adopted the provisions of the Local Government Act of 1858 and became the Local Board of Health. The Commissioners passed certain by-laws in accordance with the 1858 Act and incorporated the Public Health Act, 1875, and those by-laws became the by-laws of the Corporation. The plaintiffs complained that the defendant had put up large buildings which, if they were not pulled down, would fall down shortly; plans were approved; but the defendant had erected buildings contrary to them, and he had now delivered amended plans, which the plaintiffs had rejected for good reason. Upon approving a plan depended such matters as the thickness of walls and the height of buildings. His lordship would hear in evidence that the defendant had put up walls 4½ in. thick, rising to a height of 70 ft., so that the structure was in itself a dangerous one. Since the action had been set down for trial some part of the lower wall had begun to bulge. The second by-law which had been infringed was the provision as to air space at the back of the houses. The by-laws stated that a building of three stories should be 20 ft. from the nearest property, but in the houses of the defendant, which were four stories, there must be 25 ft. of space at the rear of the premises. The approved plans were for three-story buildings, but the defendant had erected houses of four stories and three attics. The third infringement had reference to the height of a building adjoining the street.

His Lordship asked if there was any dispute as to facts?

Mr. Eve said he knew nothing about the defendant's houses tumbling down. There would be no dispute as to the height of the houses to a particular point on the opposite property or as to the height of the eaves in front.

Mr. Micklem stated that the four houses of the defendant stood at the corner of streets known as Valley-drive and Valley-mount. The plans were passed in 1896; two houses had been erected in accordance with the plan, and two other houses were those in question in the action.

Mr. Eve stated that the defendant thought there were too many builders on the Corporation.

Mr. Micklem said Valley-mount was 36 ft. wide, and it went round the rear of the defendant's houses into Valley-drive, which was 60 ft. wide. The plaintiffs contended that the defendant could not put up a house facing Valley-mount of a greater height than the width of the road.

His Lordship asked the defendant's counsel if he disputed that he was building contrary to the plans.

Mr. Eve replied that the plans which were approved by the Corporation were subsequently found not to be in accordance with the by-laws, and it became necessary to modify the plans.

Mr. Micklem said the by-laws provided that every building to be erected and used as a dwelling-house should have in the rear 150 square feet free of any erection thereon, and by the Corporation Act no house was to be erected of a greater height than the distance from the front of the building to the opposite side of the street. The plaintiffs gave the defendant notice not to continue building in contravention of the by-laws, but no notice was taken of that.

Mr. Geo. Richardson Strachan, M.Inst.C.E., examined by Mr. Micklem, said he had examined plan A, which was submitted, and disapproved of it, in January last. Witness had not visited the locality, but had studied the plan, and he should say it represented a building of slight, flimsy structure, and in a condition of critical instability. That was to say, if one part gave way the whole structure would come down like a pack of cards.

Mr. Eve said he admitted that the building was not in accordance with any of the plans approved. The defendant's point was that it was in accordance with the by-laws.

Mr. Parker observed that in cases of this sort if a plan was disapproved on any ground which was not tenable by reason of the by-laws, then the disapproval did not prevent the building being erected in accordance with the plan. It was pleaded generally by his learned friend for the defendant that the whole building was in accordance with the by-laws, and therefore he had a right to go on with it; but this was merely to show the court that the building was of such a nature that it was a building which never could have been passed because it would be a danger to the public. The thickness of the walls provided by the by-law was one of the safeguards against such a contingency.

Mr. Frank Bagshaw, the Borough Surveyor of Harrogate, in his evidence, said that he had been connected with the Harrogate Corporation for fourteen years. The roads on the Valley Park Estate came under the control of the Corporation. The Corporation in 1896 approved certain plans submitted by the defendant for the erection of twelve houses in Valley-mount and those plans were approved in July, 1896. Two houses were erected in accordance with the plans, but in June last witness called defendant's attention to the fact that two other houses differed from the plans which had been approved. Amended plans were sent in but they were disapproved because the height of the eaves of the buildings exceeded the height permissible in proportion to the width of the street; the drainage did not agree with the plans. Some of the bedrooms had less than 100 superficial feet, had no fireplaces, and were without proper ventilation; the causeway was not wide enough, and the defendant was excavating within 600 yards of the old sulphur well. Some of the plans showed that the buildings were to be of three stories, but the defendant had put up four-story buildings, the means of exit from which were totally inadequate. He had seen the buildings recently, and there was a big bulge in one of the walls which had to be shored up.

Cross-examined, the witness said that no plans of the buildings in question had ever been approved by the Corporation. The drainage was put right in subsequent plans, and to a certain extent the small bedrooms had since been ventilated. As to the statute prohibiting excavations within 600 yards of the old sulphur wells, he agreed that the defendant only excavated a few feet for the purpose of laying foundations. A wall 4½ in. thick was not common in Harrogate. He thought that some of the walls of defendant's houses should be considerably more than 9 in. in width.

This concluded the case for the plaintiffs, and Mr. Eve said that the action had been founded on three points, *i.e.*, that the plans were not approved by the plaintiffs, that the houses were in violation of the statutory provision that the height should be equivalent to, and not exceeding, the width of the road to which they fronted, and that the ventilation space at the back was not in accordance with the by-law. He admitted that the defendant had not got the approval of the Corporation to the plans, and that the height of the buildings was in excess of the height permitted, but he contended that the ventilation was thorough, and that the defendant had complied with the spirit of the by-law.

Mr. Justice Cozens-Hardy said he was very much impressed by the fact that some of the walls were only 4½ in. thick.

Mr. Eve thought that could be rectified, and if there was any danger from the internal walls being too thin, they could be converted into a proper thickness.

His Lordship did not suppose that the Harrogate Corporation desired to do anything but their duty, but the defendant was in mercy and he must make some terms with them.

Mr. Eve hoped that his lordship would bear in mind that the defects in construction were not put forward in the statement of claim.

His Lordship did not think that a public body was bound to go through the plans and specify every objection. The defendant had deliberately gone on building when he knew that his plans were not approved.

At this stage learned counsel consulted with their respective clients, and

Mr. Micklem informed his lordship that the parties had agreed to an order. The defendant was prepared to remove the upper part of his building, to strengthen all the walls as might be required by the Corporation, and to submit forthwith plans to be approved.

Mr. Eve stated that on defendant giving that undertaking there would be no order in the action except that the defendant should pay the costs.

His Lordship said he approved of the arrangement, and said it was a matter of extreme importance to the Corporation that builders should be taught they could not go on with buildings without the plans being approved.

FINSBURY-CIRCUS IMPROVEMENT

IN the City of London Court, on the 26th ult., Messrs Ralli Bros., 25, Finsbury-circus, sued Messrs. Wernher, Beit, & Co., 120, Bishopsgate Within, by way of an appeal under the London Building Act, 1894, for an order to set aside an award, dated December 18, which had been made by Mr. Thomas Blashill and Mr. H. T. Gordon as surveyors in an arbitration with respect to premises in Finsbury-circus. Mr. R. M. Bray, K.C., and Mr. Rowlett were counsel for Messrs. Ralli, and Mr. Macmorran, K.C., and Mr. Bower for Messrs. Wernher, Beit, & Co. Mr. Bray said that the plaintiffs were the occupiers and lessors of Nos. 25, 26, and 27, Finsbury-circus. Their buildings were surrounded by a number of other buildings, of which, apparently, Messrs. Wernher had taken a lease from the Corporation. They had pulled down those buildings, and they now wanted to pull down all Messrs. Ralli's outside walls except the front wall. There was a west wall (the wall of No. 27), and there was an east wall (at No. 25), while the south wall formed the back part of the premises. The defendants wanted to pull all three of them down. If this were done the plaintiffs would be compelled to move from their premises for some months, and that would involve serious expenditure, probably amounting to 500*l.* That they naturally did not want to do. The defendants' contention was that under the Building Act they were entitled, as building owners, to do what the award had said they might carry out. Mr. Commissioner Kerr said the point in dispute was simply concerned with the construction of the Act of Parliament. As both parties had stated that they intended appealing whichever way the decision went, he would say at once that he was inclined to dismiss the appeal from the arbitrators. Before doing that the case might stand over so that the parties might go direct to the High Court, and have the matter decided there.—*City Press.*

THE LONDON BUILDING ACT:

AN "IMPRACTICABLE AND WORTHLESS" MEASURE.

AT the Mansion House recently, before Alderman Sir H. E. Knight, Messrs. Weary & James, builders,

were summoned by Mr. Hugh McLachlan, the District Surveyor for the western division of the City, for having on the 14th ult. begun to execute certain work at 169, Fleet-street, without serving upon him a notice as required by Section 145 of the London Building Act, 1894. Mr. Weary, who appeared, said that notice was given. Mr. McLachlan stated that the document he received did not contain sufficient particulars. As he had to make returns to the London County Council, giving all details, he wrote to the defendants, and asked them, amongst other things, for the name of the owner of the premises. He received a reply to the effect that they did not know it. Sir Henry: I understand that the work done was the putting-in of a shop-front. This section requires the builder to state the situation, area, &c. Is he to make a survey? Mr. McLachlan: Evidently the law requires it. Sir Henry: Then the number of stories, and the "intended occupation" are required. The Act is so badly drawn that you ask a man to do the impossible. He could not state the "intended occupation," because the place was already occupied. The Chief Clerk: And you could not give the number of stories to a shop front? Sir Henry: The Act may have been drawn by some philosopher, who sat in his closet and thought it a theoretical accomplishment, but I look upon it as impracticable and worthless. Mr. McLachlan said that if the defendants now gave him the name and address of the owner he would be satisfied with the costs of the summons. Sir Henry: That is my business. You must not tell me what to do. Looking at the case all round, I dismiss the summons.—*City Press.*

WOODEN STRUCTURES ERECTED WITHOUT LICENCES.

ON Tuesday, the 5th inst., at Marlborough-street Police Court, four builders were summoned for having erected wooden structures at various premises in Piccadilly, for viewing the procession on the return of Lord Roberts in January last, without having obtained licences as required under Part VII. of the London Building Act, 1894. The offences were admitted and a penalty of 40s. and 12s. 6d. costs was imposed in each case.

THE BLUE LIAS LIME PROSECUTION.

THE prosecution under the Merchandise Marks Act, in which the Cam Portland Cement Company, Limited, are sued by the Blue Lias Lime Company for selling as blue lias lime that which it is alleged was not blue lias lime, was on Wednesday, at the Westminster Police-court, adjourned for a week, owing to the inability of Mr. Wills, who is prosecuting, to attend.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

21,810.—ELECTRICAL CURRENT METERS: *H. P. Davis and F. Conrad.*—For ampére (or volt) meters a single permanent U-shaped magnet is used, or for that may be substituted two U-shaped permanent magnets, set parallel to one another and having their like poles together, carrying two hook-shaped pole pieces of which the curved portions are disposed with a small interval between them and parallel to one another, with a curved and adjustable magnetical plate beneath the pole pieces; the pivots of a light movable frame are carried by two jewelled pins fixed in a horizontal rectangular frame mounted upon the magnet or magnets, the movements are damped magnetically with a flat plate that balances the movable frame and is passed between the pole pieces; two flat spiral springs carried by the jewelled pins are connected at their outer ends with the ends of the coil that is wound upon the bobbin of the movable frame, whilst the outer ends of the springs are secured to, but are insulated from, the arms of that frame; on the magnets is a curved scale which is traversed by a pointer upon the movable frame.

21,814.—A METHOD OF TREATING WOOD: *G. F. Lebioda.*—A preservative compound, consisting of a solution of formaldehyde combines with and tends to make insoluble the albuminous substances contained in the wood, and if sufficient of those substances is not in the wood, the formaldehyde should be mixed with a solution of agar-agar or some such gelatinous material. The invention is specified as being applicable for use with telegraph-posts, railway sleepers, and so on.

21,823.—A BRICKLAYING MACHINE: *J. H. Knight.*—The machine is intended for travelling along a rack at the top of a beam or girder that is fastened with pins or bolts to pierced standards. Rotating flexible arms, on to which the bricks are fed by hand, impel them into position beneath a pressing-roller mounted upon a winch shaft, of which the pinion will gear with the rack, the winch-spindle driving the arms by means of a friction clutch and an endless chain. The bricks are kept in their lines with a separate guide-roller, or a straight-edge secured to the beam is arranged so as to press against one side of the wall, whilst the pressing-roller is flanged at the other side of the wall. A hopper applies mortar or grouting to the upper surfaces of the bricks upon the return motion of the machine. For the apertures of windows and doors, the machine lays dummy bricks made of wood or hollow metal, that are to be removed afterwards for ordinary bricks, at times which are sounded with bells or gongs upon the beam, which is joined with chains to counter-weights, and is lifted when each course has been laid. Other forms of the invention are specified; in one of them the roller, instead of the beam, is lifted after the laying of each second, third, or other course, by its being mounted upon a pivoted arm, so that it can be dipped to beneath the beam and for the laying of foundation or ground courses, the winch shaft driving it with toothed gearing upon the pivoted arm.

21,826.—PERCUSSIVE TOOLS: *A. Taylor.*—The hammer-head that strikes the chipping or other tool constitutes a part of a piston to be operated with compressed air that is forced from annular chambers through passages to either the top or the bottom of the cylinder. By means of a handle that is screwed into the inlet the tool can be held as an ordinary hammer.

21,877.—ELECTRICAL ARC LAMPS: *A. Vosmaer.*—The two electrodes are made of nickel or a nickel alloy (or one of them may be made of copper), and are attached at a distance of a few millimètres apart, a small current being used under a high pressure, so that their wear shall be inappreciable, as the end of the nickel electrode takes a coating of oxide from which the light is emitted. It is claimed that the employment of an alternating current of ·1 ampére at 500 volts and electrodes having a diameter of three millimètres will produce a light of fifty candle-power.

21,889.—SURVEYING INSTRUMENTS, INCLUDING THEODOLITES: *R. Reeh.*—For stadiometers, miners' tacheometers, theodolites, and kindred instruments which give readings in altitude and azimuth, the inventor contrives that an image of the azimuth and altitude circles shall be brought into the field of the telescope. He fashions the telescope trunnions in the shape of tubes which are provided with prisms and lenses; the tube on the left hand constitutes, together with a tube mounted upon the Y's and having a lens and a reflector, a microscope, that, aided by a split lens, will focus an image of the azimuth scale in the plane of the crossed wires. The Y's carry the altitude circle, which is graduated inside, an image being likewise produced by means of another tube having a lens and a reflector, a right-hand tube, and a split lens. Direct vision is provided for by means of the sufficient space between the halves of the lens.

21,920.—AN ATTACHMENT FOR DRAWING-COMPASSES: *A. H. Woodward.*—To adapt compasses for the holding of differently sized pencils is devised a blank having arms that form ears in which a tightening lever can be pivoted; when the lever is turned upwards the pencil becomes gripped between the toothed edges of the appliance.

21,929.—COCKS OF SUPPLY PIPES AND HYDRANTS: *W. R. Sage.*—In order to drain water out of the cocks and so to prevent them from becoming frozen, an additional valve is made to open a duct into the drain pipe with the action of turning the plug in order to cut off the supply. Ingress of flood water to the stand-pipe is obviated with a check valve.

21,936.—A FLUSHING-WATER APPLIANCE: *C. Birkery and T. Standish.*—A tubular stem sliding within a concentrical stem that rises from the bottom of a cup mounted upon legs is fitted upon the outlet valve, a float which has a tubular stem slides upon the outside of the cup, the lifting of the valve for effecting a flush causes it to be locked through the engagement of a pawl pivoted on to the stem of the valve, with a slotted peak upon the float-stem. Upon the escape of water from the cup through a time-passage the float continues to fall until the pawl has been liberated through the impact of the tripping-lever against the bottom of an adjustable slot so as to let the valve fall down on to its seating. The top of the valve becomes closed with a loose disc when it has been lifted, and the disc is lifted through contact with the float-stem when the valve rests upon its seating, so that the valve-stem is thereby left free to act as an overflow pipe.

21,963.—CONSTRUCTION OF HOLLOW WALLS: *L. Fink.*—Dove-tail recesses are fashioned in building blocks so that they may take transverse dove-tail bonding blocks. The building blocks consist of an admixture of light beton made up of cement 1 part and sand 4 parts, a stronger beton or burned clay being used for the bonding blocks. In order to check the passage of moisture from the outer to the inner wall, tar or asphalt is applied to the inner surfaces of the building blocks and to the bonding blocks.

21,970.—A CUTTER FOR CONDUIT TUBES, &C.: *H. von Appen.*—On the jaws of the tool, which is intended for cutting through the tubes that serve to protect and insulate electrical conductors, &c., are mounted two or more parallel blades having their cutting edges curved and spaced apart; in one modification a blade will cut the outside protecting tube at a distance from its end, whilst another blade cuts the inner insulating tube. Springs that extend between the pivoted handles of the tool serve to force the cutters against the tubes, and either anti-friction rollers or additional similar blades can be placed opposite the cutting blades.

21,971.—BASINS FOR LAVATORIES AND THEIR FASTENINGS: *R. W. MacDonald.*—The basin is fastened securely in two ways, upon the soil-pipe standard are disposed clamping rings with which arms are adjusted, and the soil-pipe, to the top of which the basin is fixed, is mounted upon legs which surround the trap below.

21,985.—HOISTING APPARATUS: *J. Price.*—Upon a shaft are mounted two winding-drums, the one drum being for lifting purposes and the other for the rope which operates the bucket; the relative revolution of the drums is provided for by means of a spiral groove having about three complete turns which is made in the end of the one drum, and will engage with a cranked pin at the end of the other drum.

22,104.—A GUARD FOR CIRCULAR SAWS: *J. Bodger and D. Handford.*—For circular saws and tools wherein the hood is raised automatically, a sleeve that will slide along an inclined rod (which is clamped on to the radial arm of the pillar) is fitted upon the hood, which is made of two plates set side by side with a space between them for the saw. As the wood is being pushed forwards beneath a curved rod it raises the hood. For means of access to the saw the workman hooks a stud upon the sliding sleeve into a hook that hangs above from the clamp of the rod and loosens the set-screw in order that the radial arm may turn about the pillar.

22,141.—PREVENTION OF FIRE IN LIFTS: *F. Toye.*—A fireproof flap, which remains shut during all the time when the lift is not being used, is provided at each floor-level of the well. The flaps are raised whenever the lift is at work, being moved in unison with a rod upon which are projections to engage with slotted links. Of every link one end will slide in a guide upon the back of its corresponding flap, whilst the other end is secured with a pivot.

22,155.—CONSTRUCTION OF WALL LININGS, &C.: *P. Chick.*—The bricks are fashioned with undercut grooves, and the boards, skirting, wall-linings, or similar woodwork is fastened on to dove-tailed plugs or strips, which are inserted into the grooves. The strips can be made so as to project as much as the thickness of the plaster, and thereby afford a guide for the plasterer, or they may be built in flush with the brickwork of the wall.

22,165.—A SPIRIT LEVEL: *A. Gohl.*—The inventor has devised a spirit-level tube which he shapens as a circle-quadrant and mounts upon a straight-edge, whereof the weaker portion is strengthened with a plate of metal; he also provides a U-shaped plate which is to be pulled up when the instrument is being used, and will thus protect the tube; the position of the bubble will be accurately read with a sliding index to which a vernier may be attached.

22,167.—LIFTING-JACKS: *C. Busch.*—Between the two standards of the jack is a screwed shaft on which a nut travels up and down the shaft, being turned with a crank that operates by means of bevel gearing and pinions whereof one is affixed to the top of the shaft; beneath the load which it is desired to raise is laid a beam of which the ends are put upon the nuts of two of the jacks.

22,209.—SPIGOT-AND-SOCKET JOINTS FOR PIPES: *T. Cartman.*—The invention is for making a joint between pipes of hard metal or material, such as iron, brass, earthenware, and pipes of soft metal or material; the soft pipe is inserted into the socket of the hard pipe for which it constitutes a lining, and hemp is used as a packing between the joint and the cement.

22,248.—AN APPLIANCE FOR PURPOSES OF VENTILATION: *R. T. Preston and G. C. Ralston (of Stone & Co.).*—The appliance is contrived for the drawing-off of foul air from buildings, tunnels, mines, and other places, into a tank by means of water or other liquid under pressure, and for effecting a discharge of the mixed air and water. Below the water-level in the tank is laid a double pair of ejectors, to which water is supplied under pressure. The foul air, after it has been drawn in through pipes, is discharged, together with the water, into an overflow pipe. Each ejector is fitted with an adjustable nozzle, and, for mines, the ejector-tank apparatus is rendered portable by being mounted upon wheels.

22,271.—MEANS OF HEATING BY ELECTRICITY: *A. Vogt.*—Admixtures of finely pulverised metals and refractory non-conductors with a liquid, are moulded into resistances that will sustain high temperatures, and are pressed in the moulds so as to bring about uniform results; having been dried the articles are heated in hydrogen, though at the outset to a temperature that will just entirely reduce the oxide upon the particles of metal; then the non-conducting components are caused to "frit" (care being taken to exclude carbon) by increasing the heat up to the welding-heat of the metal, whilst in the atmosphere of hydrogen; the constituent parts of the compound comprise nickel, cobalt, or wolfram, together with kaolin, alumina, quartz, talc, and other rare earths or oxides, and the articles are specified as being available for heating bodies which need preliminary heating in order to make them conductive.

* See our issue for February 9, page 145, for a report of a previous hearing of the case.

MEETINGS.

FRIDAY, MARCH 8.

Architectural Association.—Special general meeting to consider the Committee's scheme for the establishment of day classes. 7.30 p.m.

Royal Institution.—Mr. W. A. Shenstone, F.R.S., on "Vitrified Quartz." With experimental illustrations. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. C. Johnston on "Sewage Treatment." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor T. Roger Smith on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions." 8 p.m.

Glasgow Architectural Craftsmen's Society. — Mr. J. Lochhead on "The Decay of Building Materials." 8 p.m.

SATURDAY, MARCH 9.

Royal Institution.—Right Hon. Lord Rayleigh on "Sound and Vibration." III. 3 p.m.

Institution of Junior Engineers.—Visit to the Southall Station of the Brentford Gas Company to inspect the carburetted gas plant, inclined retorts, &c. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Beddington Sewage Farm. 3 p.m.

Dundee Institute of Architecture.—Mr. C. G. Soutar on "Ecclesiastical Architecture in Fifeshire." With lime-light illustrations. 7 p.m.

Edinburgh Architectural Association. — Visit to Archers' Hall and Craigmillar Park United Free Church.

MONDAY, MARCH 11.

Surveyors' Institution.—Adjourned discussion on Mr. Thomas Blashill's paper on "The Present Condition of the Building Industry." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Ventilation, Warming, and Lighting." 7 p.m.

Society of Arts (Cantor Lectures).— Major Philip Cardew on "Electric Railways." I. 8 p.m.

Clerks of Works' Association (Carpenters' Hall, London Wall).—Monthly meeting. 7.30 p.m.

Bristol Society of Architects.—Mr. Archibald Dawnay on "Constructional Steelwork as Applied to Building." 8 p.m.

TUESDAY, MARCH 12.

Institution of Civil Engineers.—Mr. J. Husband on "The Æsthetic Treatment of Bridge Structures." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Hugh Stannus on "Some Examples of Romanesque Architecture in North Italy." Mr. T. G. Jackson, R.A., will preside. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Calculations, Measurements, and Plans and Sections." 7 p.m.

WEDNESDAY, MARCH 13.

Architects' Benevolent Society.—Annual General Meeting of the Subscribers and Donors, in the Rooms of the Royal Institute of British Architects. The President, Mr. William Emerson, will take the chair at 5 o'clock.

Architectural Association Discussion Section.—Mr. H. P. G. Maule on "The Architect and the Garden." 7 p.m.

Sanitary Institute.—Dr. Christopher Childs, M.A., on "Ventilation: Success and Failures of the Methods at Present in Use." 8 p.m.

Society of Arts.—Mr. F. B. Behr on "The Proposed High-Speed 'Monorail' between Liverpool and Manchester." Sir William Preece will preside. 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Millbank-street Pumping Station of the London Hydraulic Power Company (assemble at the works, 51, Millbank-street, Westminster). 2.30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Boake, Roberts, & Co.'s Chemical Works, Stratford. 2.30 p.m.

Institute of Sanitary Engineers (Incorporated).—Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m.; Sessional Meeting at 7 p.m.

Edinburgh Architectural Association.—Mr. J. M. Brydon on "The Work of Cockerell." 8 p.m.

Edinburgh Architectural Society.—Mr. J. Stuart Syme on "San Micheli and his Work."

Northern Architectural Association.—Annual meeting. 7.30 p.m.

THURSDAY, MARCH 14.

Carpenters' Hall, London Wall.—Mr. W. E. Riley on "Dwellings for the Working Classes." 8 p.m.

Royal Institution.—Professor Percy Gardner on "Greek and Roman Portrait Sculpture." III. 3 p.m.

Society of Arts (Indian Section).—Mr. H. J. Tozer, M.A., on "The Growth and Trend of Indian Trade—a Forty Years' Survey." 4.30 p.m.

Institution of Electrical Engineers (at the Institution of Civil Engineers).—Mr. A. C. Eborall on "Polyphase Substation Machinery." 8 p.m.

Sheffield Society of Architects and Surveyors.—Paper by Mr. E. W. Mountford. 7 p.m.

FRIDAY, MARCH 15.

Architectural Association.—Mr. H. B. Measures on "Rowton Houses." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. C. Tyndale on "Sanitary Appliances." 7 p.m.

Institution of Mechanical Engineers.—Mr. A. N. Connett on "Combined Trolley and Conduit Tramway Systems." 8 p.m.

SATURDAY, MARCH 16.

Architectural Association.—Third Spring Visit to Stanhope House, Park-lane, W., by permission of the architect, Mr. W. H. Romaine-Walker. 2.30 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh on "Sound and Vibration." IV. 3 p.m.

Incorporated Association of Municipal and County Engineers. — Home District Meeting, to be held at Wimbledon.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 21.—By GERMAN & GERMAN (at Loughborough).

Normanton-on-Soar, Notts.—The Manor House Estate, 116 a. 2 r. 26 p., f., including the Manor (in lots) £10,948

February 22.—By HORNE & CO.

Walworth.—1, Hampton-st., with cab-yard and stabling, f., r. 63*l.*; also a railway arch, u.t. 968 yrs., r. 1*l.* 1,190

By JONES, LANG, & CO.

Kensington.—23 and 25, Kensington Park-rd., u.t. 61 yrs., g.r. 30*l.*, e.r. 100*l.* 855

By A. J. SHEFFIELD.

Bethnal Green.—24, Arbery-st., u.t. 50 yrs., g.r. 5*l.* 10s. 295

Canning Town.—4, Ford's Park-rd., u.t. 87½ yrs., g.r. 4*l.* 4s. 130

2 to 18 (even), St. Thomas'-rd., u.t. 97½ yrs., g.r. 37*l.* 16s. 1,025

Poplar.—60, Spey-st., u.t. 64 yrs., g.r. 4*l.* 285

Limehouse.—43, 45, and 47, Limehouse-causeway, f. 600

Plaistow.—Grange-rd., f.g.r. 12*l.*, reversion in 90 yrs. 270

129, 131, and 133, Pelly-rd., f. 675

Poplar.—79, Tetley-st., u.t. 41 yrs., g.r. 2*l.* 10s. .. 170

February 23.—By BENTLEY & SONS (at Pontefract).

Kensall, Yorks.—Kensall House Farm, 114 a. 0 r. 23 p., f. 5,150

Four closes of land, 14 a. 2 r. 21 p., f. 790

By WILLSON & PHILLIPS (at Southend).

Southend-on-Sea, Essex.—53, Avenue-rd., u.t. 78½ yrs., g.r. 5*l.* 8s. 360

February 25.—By EASTMAN BROS.

Peckham.—87, Commercial-rd., u.t. 42½ yrs., g.r. 3*l.* 3s., r. 21*l.* 235

Commercial-rd., i.g.r. 15*l.* 15s., u.t. 42½ yrs., g.r. 9*l.* 9s. 130

Bexley Heath, Kent.—Lion-rd., Wye Lodge and 2 r. 53 p., f., r. 40*l.* 580

By Messrs. KEMSLEY.

Bow.—21 and 22, Merchant-st., f., r. 91*l.* 1,045

Hackney.—102 and 110, Amhurst-rd., u.t. 65¼ yrs., g.r. 14*l.* 7s., r. 96*l.* 1,035

1 and 3, Greenwood-rd., u.t. 50½ yrs., g.r. 13*l.* 8s. 825

February 26.—By DEBENHAM, TEWSON, & CO.

Regent's Park.—4, York-gate, u.t. 20½ yrs., g.r. 40*l.*, r. 160*l.* 1,000

Kilburn.—23, Carlton-vale, u.t. 48¼ yrs., g.r. 8*l.*, r. 65*l.* 560

By FURBER, PRICE, & FURBER.

Newington.—77, Newington-causeway, f., e.r. 100*l.* 1,335

By MOSS & JAMESON.

Kingston-on-Thames, Surrey.—14, 16, and 18, St. James'-rd., u.t. 56 yrs., g.r. 12*l.*, r. 90*l.* 900

By RUTLEY, SON, & VINE.

Tottenham Court-rd.—26, Tottenham-st., f. 955

Hampstead-rd.—10, Rutland-st., f. 1,200

Holloway.—106, Devonshire-rd., u.t. 51½ yrs., g.r. 6*l.* 6s., r. 34*l.* 370

Finchley.—24 and 26, Stanhope-rd., f. 480

By S. CLIFFORD TEE.

Forest Gate.—9, 11, 15, and 17, Studley-rd., u.t. 81¼ yrs., g.r. 26*l.*, r. 115*l.* 16s. 900

By FREDK. WARMAN.

Holloway.—132, Tollington Park, f., e.r. 60*l.* 710

By J. C. PLATT (at Hammersmith).

Hammersmith.—38, Overstone-rd., u.t. 65 yrs, g.r. 6*l.*, e.r. 40*l.* 365

30, Iffley-rd., u.t. 65 yrs., g.r. 6*l.*, r. 34*l.* 350

Shepherd's Bush.—53, Coningham-rd., u.t. 71¼ yrs., g.r. 7*l.*, r. 36*l.* 350

40 and 42, Wingate-rd., u.t. 42½ yrs., g.r. 14*l.*, r. 62*l.* 620

364, Goldhawk-rd., u.t. 25 yrs., g.r. 4*l.*, r. 40*l.* . 300

Chiswick.—488, High-rd., u.t. 70¼ yrs., g.r. 6*l.* 6s., r. 32*l.* 550

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Boscombe, Hants.—Christchurch-rd., the Palmerston Arms p.h., u.t. 56½ yrs., r. 250*l.*, with goodwill 16,680

February 27.—By JOHN BOTT & SON.

Herne Hill.—2 to 14 (even), Kestral-avenue, u.t. 64 yrs., g.r. 58*l.* 10s., r. 307*l.* 3,000

By BRADSHAW BROWN & CO.

Poplar.—Bowley-st., freehold manufacturing premises, area 7,000 ft., r. 40*l.* 1,900

By ELLIOTT, SON, & BOYTON.

New Oxford-st.—No. 60, u.t. 24 yrs., g.r. 45*l.*, e.r. 200*l.* 1,970

Regent-st.—65, Mortimer-st., u.t. 17 yrs., g.r. 12*l.*, r. 110*l.* 885

By WALTER HALL.

City of London.—26, Moorgate-st., u.t. 15¼ yrs., g.r. 31*l.*, r. 365*l.* 1,660

Peckham.—Reedham-st., &c., i.g.r. 47*l.*, u.t. 43 yrs., g.r. 12*l.* 600

By R. TIDEY & SON.

Victoria Park.—20, 21, and 22, Hedgers-grove, u.t. 50¼ yrs., g.r. 12*l.* 12s. 325

Haggerston.—27 to 37 (odd), Dunstan-st., u.t. 18 yrs., g.r. 25*l.* 755

28 to 44 (even), Dunstan-st., u.t. 18 yrs., g.r. 29*l.* 1,250

2 to 10 (even), Loanda-st., u.t. 18 yrs., g.r. 13*l.* 10s. 745

39 to 45 (odd), Loanda-st., u.t. 18 yrs., g.r. 12*l.* 605

40 to 56 (even), Loanda-st., u.t. 18 yrs., g.r. 27*l.* 1,170

Islington.—16, Elmore-st., u.t. 51½ yrs., g.r. 8*l.*, r. 37*l.* 385

By WYATT & SON (at Chichester).

Birdham, Sussex.—Oaklands Farm, 15 a. 3 r. 2 p., f. 580

Sidlesham, Sussex.—A cottage and 10 a. 0 r. 10 p., f. 420

A freehold house and 1 a. 0 r. 30 p. 250

A freehold barn, stable, &c., and 0 a. 3 r. 14 p.. 100

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 15 0	per 1,000	alongside,	in river.
Rough Stocks and Grizzles	1 12 0	,,	,,	,,
Smooth Bright Facing Stocks	2 18 0	,,	,,	,,
Shippers	2 8 0	,,	,,	,,
Flettons	1 9 0	,,	,,	,,
Red Wire Cuts	1 15 6	,,	,,	,,
Best Fareham Red	3 11 6	,,	,,	,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,,	,,
Best Blue Pressed Staffordshire	4 7 0	,,	,,	,,
Do., Bullnose	4 12 0	,,	,,	,,
Best Stourbridge Fire Bricks	4 4 6	,,	,,	,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers	16 0 0	,,	,,	,,
One Side and two Ends	19 0 0	,,	,,	,,
Two Sides and one End	20 0 0	,,	,,	,,
Splays, Chamfered, Squints	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers	14 0 0	,,	,,	,,
One Side and two Ends	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
plays, Chamfered, Squints	14 0 0	,,	,,	,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best	

	s. d.	
Thames and Pit Sand	7 6	per yard, delivered.
Thames Ballast	6 3	,, ,,
Best Portland Cement	38 0	per ton ,,
Best Ground Blue Lias Lime	25 6	,, ,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 13s. 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 32s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube, deld. rly. depôt.	
Bath ,,	1 7	,,	,,
Farleigh Down Bath	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,,	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks	2 1½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York in blocks	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 3 in. self-faced Ditto	0 9½	,,	,,

SLATES.

in. in.	£ s. d.			
20×10 best blue Bangor	11 5 0	per 1000 of 1200 at ry. dep.		
,, best seconds ,,	10 15 0	,,	,,	
16× 8 best ,,	6 2 6	,,	,,	
20×10 best blue Portmadoc	10 18 0	,,	,,	
16× 8 best blue Portmadoc	6 0 0	,,	,,	
20×10 best Eureka unfading green	11 2 6	,,	,,	
16× 8 ,, ,,	6 15 0	,,	,,	
20×10 Permanent green	10 0 0	,,	,,	
16× 8 ,, ,,	5 12 6	,,	,,	

TILES.

	s. d.			
Best plain red roofing tiles	41 6	per 1,000	at rly. depôt.	
Hip and valley tiles	3 7	per doz.	,,	,,
Best Broseley tiles	48 6	per 1,000	,,	,,
Hip and valley tiles	4 0	per doz.	,,	,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,,	,,
Do. ornamental Do.	60 0	,,	,,	,,
Hip tiles	4 0	per doz.	,,	,,
Valley tiles	3 9	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000	,,	,,
Hip tiles	4 1	per doz.	,,	,,
Valley tiles	3 8	,,	,,	,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16 10 0	18 0 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.	12 10 0	13 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0

[*See also page 251.*

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Road Works, Kennedy-road	Barking U.D.C.	C. F. Dawson, Surveyor, Public Offices, Barking	Mar. 12
Refuse Destructor Buildings	Glasgow Corporation	J. Young, 88, Renfield-street, Glasgow	do.
Granite (1,400 tons)	Bourne (Lincs) U.D.C.	S. R. Andrews, Council Offices, Bourne	do.
Granite Road Metal, &c.	Ely R.D.C.	A. D. Ennals, Surveyor, Lynn-road, Ely	do.
Chapel	Arnside Parish Council	G. L. Hoggarth, Architect, 69, Highgate, Kendal	do.
Dynamo House, Dagenham	West Ham Town Council	Borough Engineer, Town Hall, West Ham	do
Additions to Schools, Alperton	Harrow U.D. School Board	Houston & Houston, Architects, 5, York-buildings, Adelphi	do.
Cottages, Mainhouse Farm, Kelso, N.B.	Wokingham R.D.C.	R. C. Cameron, Bank of Scotland, Kelso	do.
Extension of Water Mains, Upper Culham	Glasgow Corporation	J. F. Sargeant, District Council Offices, Wokingham	do.
Seven Houses, Baltic Street, Bridgeton	Gloucester Corporation	Burnet & Boston, Architects, 180, Hope-street, Glasgow	do.
Additions to Refuse Destructor Buildings	Methodist Trustees	H. A. Dancey, Architect, 26, Clarence-street, Gloucester	do.
Two Cottages, Priory-lane, Downham	Bromley U.D.C.	Rev. J. Needham, Downham, Norfolk	do.
Four Houses, &c., Highgate Heaton, Yorks	Chelsea Borough Council	Rycroft & Firth, Architects, Bradford	do.
*Widening of London-lane	Hammersmith Borough Council	Surveyor, Council Offices, Bromley, Kent	do.
*Printing, &c.	Bexley U.D.C.	Town Hall, Chelsea, S.W.	Mar. 13
*Works and Materials	Enfield U.D.C.	See Advertisement	do.
Road Materials	Woolwich Union Guardians	W. T. Howse, Surveyor, Public Hall, Bexley	do.
Cast-iron Water Pipes	Hoo (Kent) R.D.C.	R. Collins, Surveyor, Court House, Enfield	do.
House, &c., Lodge-lane, Plumstead	St. Giles' Guardians	Church & Co., Architects, William-street, Woolwich	do.
Surveyor's Materials	Mr. J. Hendry	R. P. Smyth, District Council Offices, Strood	do.
Infirmary Extension, Brunswick-square, Camberwell	Rishton (Lancs) U.D.C.	E. T. Hall, Architect, 57, Moorgate-street, E.C	do.
Shops, Hanover-street, Fraserburgh, N.B.	South Shields Corporation	W. Reid, Architect, Saltoun-square, Fraserburgh	do.
Surveyor's Materials	Larne (Ireland) Guardians	Surveyor, 4, Church-street, Rishton	do.
Wood-paving King and Russell-streets	Hull Corporation	S. E. Burgess, Civil Engineer, Chapter-row, South Shields	do.
Additions to Hospital	Kilkenny R.D.C.	Mr. Pinkerton, Point-street, Larne	do.
Additions to Infirmary, Hull	Kirkcaldy Town Council	Botterill & Co., Architects, 23, Parliament-street, Hull	do.
Lodge, West Park	Manchester Corporation	J. H. Hirst, City Architect, Town Hall, Hull	do.
Twenty-one Cottages	Select Vestry	K. Comerford, Council Offices	Mar. 14
Sewers	Metropolitan Police District	W. D. Sang, Civil Engineer, Kirkcaldy	do.
Additions to St. Paul's Church, Monk Bretton, Yorks	Flaxton (Yorks) R.D.C.	Wade & Turner, Architects, 10, Pitt-street, Barnsley	do.
Extension of Fish Market, Smithfield	Elgin Town Council	City Surveyor, Town Hall, Manchester	do.
Alterations to Schools, Meltham, near Huddersfield	Churchwardens	J. Kirk & Sons, Architects, Huddersfield	do.
Alterations, &c., to Moorhills, Dewsbury	Bollington, Cheshire U.D.C.	J. Kirk & Sons, Architects, Dewsbury	do.
Two Villas, Northfield-road, Dewsbury	Mr. James Osborne	F. W. Ridgway, Architect, Bond-street, Dewsbury	do.
Additions to Church, Willowfield, Belfast	Evesham R.D.C.	W. J. Fennell, Architect, Belfast	do.
*Repairing, &c.	York Corporation	Police Surveyor, New Scotland Yard, S.W.	do.
House, Greenroyd Estate, Halifax	Messrs. Mudge	Walsh & Nicholas, Architects, L. & Y. Bank Chambers, Halifax	Mar. 15
Surveyor's Materials	Belfast Harbour Commissioners	J. Peters, 4, New-street, Yorks	do.
Underground Convenience, High-street	Dundee Town Council	Burgh Surveyor, Elgin	do.
House, &c., Glascoed, Welshpool	Cleethorpes School Board	Bremner, Smith & Bremner, Architects, Oswestry	do.
Additions to Lodge, Corndavon, Invercauld	Sunbury-on-Thames	Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Chapel, Abertridwr, Caerphilly	Mr. J. Spiridion	J. Thomas, Architect, 17, Quay-street, Cardiff	do.
Alterations to Brookside Hotel, Windermere	Tynemouth Corporation	J. Stalker, Architect, Kendal	do.
Cottages, Mill-street, East Dewsbury	Long Sutton (Lincs) U.D.C.	Marriott, Son & Shaw, C.E., Church-street Chambers, Dewsbury	do.
Renovation of St. John's Church, Highbury Vale	Carlisle Corporation	The Vicar, The Vicarage, St. John's Church, Highbury Vale	Mar. 16
Heating, Trowbridge Technical Institute	Carlton U.D.C.	H. Ledbury, Timbrell-street, Trowbridge	do.
Laying Cast-iron Pipes (2½ miles)	Farnworth (Lancs) U.D.C.	W. H. Radford, Civil Engineer, King-street, Nottingham	do.
Villa, Woodview, Ballymacreely, Ireland	Eastleigh & Bishopstoke U.D.C.	W. J. Fennell, Architect, Scottish Provident Buildings, Belfast	do.
Three Culverts, &c	Belper Joint Hospital Committee	Surveyor, Council Offices, Evesham	do.
Surveyor's Materials	Wimbledon U.D.C.	A. Creer, Civil Engineer, Guildhall, York	do.
Hall, St. Peter-street, Blackburn	Walthamstow U.D.C.	Stones & Stones, Architects, 10, Richmond-terrace, Blackburn	do.
Stables and Coachman's House, Hayle, Cornwall	Norton School Board	S. Hill, Architect, Redruth	Mar. 17
Three Timber Jetties, Musgrave Channel	Beckenham U.D.C.	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast	Mar. 18
Sea Wall	Wembley U.D.C.	W. Mackison, Civil Engineer, Municipal Offices, Dundee	do.
Alteration of Museum Buildings into Houses	West Ham Borough Council	W. Carmichael, Architect, Parton, Whitehaven	do.
Schools, Bursar-street	Chiddingstone Joint Hos. Comte.	F. W. Croft, Architect, Victoria-chambers, Great Grimsby	do.
Kerbing, &c., Staines-road	Hackney Electric Lighting Comte.	H. F. Coales, Surveyor, Sunbury-on-Thames	do.
Warehouse, Paradise-place, Cardiff	Dorchester Town Council	Veall & Sant, Architects, Cardiff	do.
Schoolhouse, Altaghaderry	Hull Corporation	E. J. Toye, Architect, Strand, Londonderry	do.
Footpaths, &c.	W. Suffolk Standing Joint Comte.	J. F. Smillie, Borough Surveyor, Tynemouth	Mar. 19
Granite Road Metal (700 tons) and Slag	York Equitable Indus. Soc., Ltd.	S. S. Mossop, Council Offices, Long Sutton	do.
Archway, Eden Bridge	Nevin Bay Granite Quarry, Ltd.	H. C. Marks, Civil Engineer, 36, Fisher-street, Carlisle	do.
Engine House, &c., near Nottingham	Mr. W. W. Crompton	R. Whitbread, Architect, Carlton, near Nottingham	do.
Car Shed	Hardwick Colliery Company, Ltd.	W. J. Lomax, Engineer, 11, Fold-street, Bolton	do.
Enlargement of House and Steading, Manor Farm	Hipperholme U.D.C.	Anderson, Chapman & Co., Solicitors, Blairgowrie	Mar. 20
*Boundary Wall and Railing	H. Cunliff	See Advertisement	do.
Additions to Hospital		Hunter & Woodhouse, Architects, Belper	Mar. 21
*Additions to Electricity Generating Station		Council Offices, The Broadway, Wimbledon	Mar. 22
*Concrete Flags		Surveyor, Town Hall, Walthamstow	do.
School and House, Ashby-de-la-Zouch		Barrowcliffe & Allcock, Architects, Loughborough	Mar. 23
*School		J. Norton, Architect, Alliance-chambers, George-street, Sheffield	Mar. 25
*Roads		Surveyor, Council Office, Beckenham	do.
*Materials		Surveyor, Public Offices, Wembley	Mar. 26
*Steam Road Roller		Borough Engineer, Town Hall, West Ham, E.	do.
*Hospital		M. M. Smith, Architect, 62, Berners-street, W.	Mar. 27
*Wharf and Lay-bye		R. Hammond, Engineer, 64, Victoria-street, S.W.	Mar. 28
Sewage Purification Works		G. J. Hunt, Borough Engineer, Guildhall, Dorchester	do.
*Destructor Buildings		City Engineer, Town Hall, Hull	Mar. 29
*Police Station, &c.		F. Wintmore, Architect, Chelmsford	April 10
Store Premises, &c., Balmoral Terrace		Athron & Beck, Architects, Doncaster	No date
Jetty at Quarry, Penrhyn Bodelias, Carnarvon Bay		Smith & Sidebotham, Civil Engineers, 1, Princess-st., Manchester	do.
Pile Driving and Foundations, Newhaven		F. J. Rayner, Engineer, 8, High-street, Newhaven	do.
Cottage, Bedlinog, near Treharris		Mr. Radford, Bedlinog	do.
Shop & Offices, Fleet-street, Bury, Lancs		Openshaw & Gill, Architects, 6, Fleet-street, Bury	do.
Hotel, Castle-lane, Carlisle		Castiglione & Gibbings, 31, Lowther-street, Carlisle	do.
Seventy-nine Cottages, Heath, Chesterfield		W. M. Ashmore, Architect, New Queen-street, Chesterfield	do.
Sewage Tank, &c.		G. H. Elliott, Architect, Lightcliffe	do.
Rebuilding St. George's Vicarage, Mossley		J. Brooke, Architect, 18, Exchange-street, Manchester	do.
Rebuilding the Theatre Royal, Newcastle		J. Carr, 41, Mosley-street, Newcastle	do.
Cottage, Scout, Newchurch, Lancs		F. J. Hobson, Architect, King-street, Rawtenstall	do.
Motor-car Works, Canal-street, Nottingham		W. D. Pratt, Architect, Cauldon-chambers, Nottingham	do.
Two Cottages, South Hiendley, Yorks		G. Moxon, Architect, 26, Church-street, Barnsley	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Scarborough Corporation	3*l.* 3s. per week	Mar. 18
*Road Ganger	Tottenham U.D.C.	2*l.* 2s. per week	do.
*Building Inspector	Tottenham U.D.C.	150*l.* per annum	Mar. 19
*Sanitary Inspector	Bristol Health Committee	1*l.* 10s. per week	Mar. 25

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. —. Contracts, pp. iv. vi. viii. x. & xxiii. Public Appointments, pp. xx. & xxiii.

PRICES CURRENT (*Continued*).

WOOD.

	At per load of 50 ft. £ s. d.	£ s. d.
Pitch pine timber (35 ft. average)	4 0 0	4 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	27 10 0	28 10 0
3 in. by 9 in.	24 0 0	25 0 0
Battens, 2½ in. and 3 in. by 7 in.	20 0 0	21 0 0
Second yellow deals, 3 in. by 11 in.	22 10 0	24 0 0
,, ,, 3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	16 10 0	18 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	25 0 0	26 0 0
Do. 3 in. by 9 in.	22 0 0	23 0 0
Battens	16 10 0	17 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	14 0 0	14 10 0
Third yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	14 0 0	14 10 0
Battens	12 10 0	13 10 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	15 10 0	16 10 0
,, ,, ,, 3 in. by 9 in.	14 0 0	15 0 0
Battens	12 10 0	13 10 0
Second white deals 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
,, ,, battens	11 0 0	12 0 0
Pitch pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 2 8
Small ,, ,,	0 2 4	0 2 7
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 2 3	0 3 0

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	8 0 0	9 0 0
Compound Girders ,, ,,	9 10 0	10 15 0
Angles, Tees and Channels, ordinary sections	9 12 6	11 12 6
Flitch Plates	10 0 0	10 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 5 0	10 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars	9 10 0	- - -
Staffordshire Crown Bars, good merchant quality	9 15 0	10 0 0
Staffordshire "Marked Bars"	11 10 0	- - -
Mild Steel Bars	9 10 0	10 10 0
Hoop Iron, basis price	10 5 0	10 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 15 0	- - -
,, ,, to 24 g.	11 15 0	- - -
,, ,, to 26 g.	13 5 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 15 0	- - -
,, ,, 26 g.	15 10 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	17 0 0	- - -
,, ,, 22 g. and 24 g.	17 10 0	- - -
,, ,, 26 g.	19 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	13 0 0	- - -
,, ,, 22 g. and 24 g.	13 10 0	- - -
,, ,, 26 g.	14 0 0	1 10 0
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	- - -
,, ,, 22 g. and 24 g.	14 0 0	- - -
,, ,, 26 g.	15 0 0	- - -
Cut nails, 3 in. to 6 in.	11 10 0	- - -
(Under 3 in. usual trade extras.)		
LEAD—Sheet, English, 3 lbs. & up.	18 0 0	- - -
Pipe in coils	18 10 0	- - -
Soil Pipe	21 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	6 0 0	- - -
Silesian	25 0 0	
COPPER—		
Strong Sheet per lb.	0 1 1	- - -
Thin ,,	0 1 3	- - -
Copper nails ,,	0 1 3	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 4½	- - -
SOLDER—Plumbers' ,,	0 0 8½	- - -
Tinmen's ,,	0 0 9	- - -
Blowpipe ,,	0 0 10	- - -

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, ,, fourths	3¾d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, ,, fourths	4¾d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, ,, fourths	5¾d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, ,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	3d. ,, ,,
⅝ ,, ,, ,,	3½d. ,, ,,
¾ ,, ,, ,,	4d. ,, ,,

OILS, &c.

		£ s. d
Raw Linseed Oil in pipes	per gallon	0 2 6
,, ,, ,, in barrels	,,	0 2 5
,, ,, ,, in drums	,,	0 2 8
Boiled ,, ,, in pipes	,,	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Turpentine, in barrels	,,	0 2 7
,, in drums	,,	0 2 9
Genuine Ground English White Lead	per ton	27 0 0
Red Lead, Dry	,,	25 10 0
Best Linseed Oil Putty	per cwt.	0 9 0
Stockholm Tar	per barrel	1 10 0

VARNISHES, &c.

	per gallon £ s. d
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. B. M.—W. B. P. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERBEEG (Mon.).—For the erection of school buildings, &c., for the Aberystruth School Board. Mr. R. L. Roberts, architect, Victoria Chambers, Abercarn. Quantities by architect:—

A. G. Howell	£6,570 0 0	W. E. Willis	£5,777 0 0
C. H. Reed	6,500 0 0	Gaen Bros.	5,709 0 0
J. Morgan	6,087 0 0	Thomas & Son	5,698 0 0
D. Lewis	5,979 0 0	Evans & Bros.	5,653 2 3
A. P. Williams, Abertillery*	5,869 0 0	J. Jenkins	5,535 0 0
Bagley & Co.	5,807 12 0	W. Britten	5,270 0 0

ASHFORD (Middlesex).—For the erection of new Board schools at Clarendon-road, for the Ashford School Board. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, London, E.C. Quantities by Messrs. Fleetwood, Son, & Eversden:—

Foster Bros.	£7,852	J. Cracknell	£7,034
Cooper & Son	7,398	R. & L. Tonge	7,000
Butcher & Hendry	7,363	Kingerlee & Sons	6,987
Gray Hill	7,264	Measom & Son	6,971
Sydney Knight	7,246	Drowley & Co.	6,898
Roome & Co.	7,200	H. Emmett	6,878
Martin Wells & Co.	7,199	E. Chamberlain	6,825
J. Appleby	7,177	Wisdom, Isleworth†	6,820
H. & B. Hansom	7,067		

ASHFORD (Middlesex).—For the erection of new Board schools at Feltham Hill-road, for the Ashford School Board. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, London, E.C. Quantities by Messrs. Fleetwood, Son, & Eversden:—

Gray, Hill, & Co.	£4,854	J. Appleby	£4,555
Foster Bros.	4,736	H. & B. Hansom	4,532
J. Cracknell	4,718	E. Chamberlain	4,525
Kingerlee & Sons	4,615	R. L. Tonge	4,500
H. Emmett	4,604	Drowley & Co.	4,462
Roome & Co.	4,600	W. Wisdom, Isleworth†	4,380
Martin Wells & Co.	4,599		
Measom & Son	4,571		

CAMBORNE.—For residence at Camborne, Cornwall, for Mr. J. M. Holman. Mr. Sampson Hill, architect, Redruth:—

	For House. £	For Oak Joinery. £
J. Colliver	3,640	815
Turner & Trounson	4,440	
J. Glasson	3,660	520
W. J. Winn	3,547	673
Hodge & Mitchell	2,922	640
John Odgers, Redruth*	2,812	554

CHURCH (Lancs).—For the construction of a sewer, Tanpits-road to Church Bridge, for the Urban District Council. Mr. W. E. Wood, surveyor, District Council Offices, Church. Quantities by surveyor:—
J. Grimshaw, Church,* as per schedule.

DOVER.—For supplying and laying water mains in Tower Hamlets and Folkestone-road, for the Town Council. Mr. H. E. Stilgoe, C.E., Town Hall, Dover:—

Biggs, Wall, & Co.	£780 0 9	Austen & Lewis	£581 3 3
D. & G. Keeler	574 18 11	L. H. Green, Dartford*	570 0 0

[Surveyor's estimate, £640.]

EASTBOURNE.—For the erection of an electric lighting station, Roselands, for the Corporation. Mr. R. M. Gloyne, C.E., Town Hall, Eastbourne. Quantities by Borough Engineer:—
Johnson & Son, 90, High Cross-street, Leicester £9,100

EAST RETFORD.—For the supply of a 12½-ton compound steam-roller for the Rural District Council. Mr. T. Henry, surveyor:—

C. D. Phillips	£497 10 0
Aveling & Porter	490 0 0
Fowler & Co.	475 0 0
Marshall, Sons & Co., Ltd.	450 0 0
Burrell's, Ltd.	421 0 0
For "Paris Exhibition" Roller.	
Marshall, Sons & Co., Ltd.,* Gainsborough	413 0 0
Sleeping Van for Three Men.	
Aveling & Porter	72 0 0
Phillips	62 14 0
Marshall's, Ltd.*	61 10 0
250 gall. Water-cart, with Pump and Balancing Gear.	
Aveling & Porter	45 0 0
Fowler & Co.	40 0 0
Phillips	37 6 0
Marshall's*	34 10 0

EAST RETFORD.—For the supply of broken granite, slag, and limestone for the Rural District Council. Mr. Thos Henry, surveyor, Retford:—

For Granite.

Ellis & Everard, Bardon Hill, Leicester*....
Charnwood Granite Co., Charnwood, Leicester*....
Mount Sorrel Granite Co., Mount Sorrel, near Loughborough*....
Croft Granite Co., Croft, Leicester*....
Sommerfeld & Mead, Hull*....
Kaltenbach & Schmitz, Hull*....
Ord & Maddison, Darlington*....
} At a schedule of prices.

For Slag.

F. T. Lazenby, Retford*....
W. Prestwich, Dronfield*....
Stanton Ironworks Co., Nottingham*....
Renishaw Ironworks Co., Chesterfield*....
} At a schedule of prices.

For Limestone.

J. & W. Mosley, Lady Lee Quarries, Worksop*.... At a schedule of prices.

FEATHERSTONE (Yorks).—For the execution of road works, Post Office-road and Gladstone-street, for the Urban District Council. Mr. F. B. Rothera, surveyor, Council Offices, Featherstone:—

Both Streets.

T. Cook Starkey	£535 18 2	Harrison & Barraclough	£255 3 6
W. Waddington	442 6 6	R. W. Ibottson	250 7 0
J. W. Broadhead	319 0 0		
M. Hall	309 12 10		

Gladstone-street.

G. Clements, Featherstone*....£127 4 9

Post Office-road.

H. Burns, Featherstone*....£94 3 6

FERNHURST (Sussex).—For the erection of school buildings, for the School Board. Mr. James Hill, architect:—

Chas. Bridger	£389 13 2	Fredk. Gale	£280 0 0
W. Harding	385 0 0	B. Slade, Fernhurst†	279 0 0
H. Hutchinson	345 0 0		

GLASGOW.—For the construction, erection, and fitting of a jeweller's and silversmith's stand at the Glasgow Exhibition, hire only. Mr. Ernest E. Fetch, architect, 20, John-street, Adelphi, W.C.:—

Scott Bros.	£1,234	Sumner & Co.*	£535
Hill & Egginton	765	Harris & Sheldon	518
Orr & Son	571		

HALIFAX.—For the erection of a warehouse, &c., Francis-street. Messrs. J. Drake & Son, architects, Queensbury:—

Masonry (amended tender).—Robinson & Sons, Halifax	£703 17
Joinery.—J. Thompson, Halifax	308 0
Slating.—Bancroft & Son, Halifax	73 10
Plastering.—Bancroft & Son, Halifax	40 13
Plumbing.—F. Lucas, Halifax	147 13
Painting.—Varley & Roebuck, Thornton	16 13
Ironwork.—Roberts & Co., Ltd., Bradford	169 10

[*See also next page.*

HOVE (Sussex).—For the execution of wood-paving works (12,516 yards super.), Holland-road, &c. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove :—
Griffiths & Co., Ltd., Hamilton House, Bishopsgate-street Without, London, E.C. £9,235

LONDON.—For alterations and additions, &c., to Sadlers' Wells Theatre, Rosebery-avenue, E.C. Mr. Bertie Crewe, architect, Savoy House, W.C. Quantities by Mr. H. E. Pollard, 6, York's Buildings, Adelphi, W.C. :—

	Alterations.	Painting.
Antill & Co.	£3,700	£250
Johnson & Co.	3,624	243
Hobson	3,493	240
Andrews	3,099	199
Veale	2,599	139
Pitcher	2,253	138
Weibking & Sons, Southgate-road, N *	2,145	145

MANSFIELD.—For making-up Duke-street for the Corporation. Mr. R. F. Vallance, Borough Surveyor, White Hart Chambers, Mansfield :—

Vallance & Blythe	£1,030 0	Lane & Son	£757 15
W. H. Cliffe	910 11	J. Greenwood, Mansfield*	741 0
Fisher Bros.	905 0		
W. A. Vallance	818 0		

MIDDLETON (Lancs).—For the erection of new store and four cottages at Parkfield, Middleton, for Middleton Co-operative Society. Mr. F. W. Dixon, architect, Trevelyan Buildings, Manchester, and Union-street, Oldham :—

Ogden & Holland	£3,087	C. Alderson	£2,966
R. Robertson	3,050	Partington & Son	2,975
W. Pollitt	3,014	Grundy, Sons, & Co.	2,960
J. Simpson	2,985	Jackson & Sons*	2,815
R. Ridings	2,982		

NOTTINGHAM.—For the erection of car-shed and offices, Piccadilly, Bulwell, for the Corporation. Mr. A. Brown, C.E., Guildhall, Nottingham :—

Crane, Ltd.	£10,250	Williamson, Ltd.	£9,100
John Hutchinson	9,905	John Lewin	9,070
F. Messom	9,889	H. Vickers	8,960
A. G. Bell	9,671	Thos. Cuthbert	8,888
J. G. Thomas	9,400	Dennett & Ingle, Nottingham*	8,750
W. Maule	9,300		
Vickers, Ltd.	9,174		

PRESTON.—For extension to police-station buildings, Lancaster-road and Earl-street. Mr. Thomas Cookson, Borough Surveyor and Engineer :—

John Christian	£8,770 0 0	M. Shorrock	£8,276 11 1
Charles Walker	8,627 15 0	Topping Bros.	8,250 0 0
T. & R. Colley	8,487 15 0	T. Hill	8,167 14 0
W. Whiteside	8,452 4 2	W. Hothersall	8,163 0 0
T. B. Garnett	8,420 0 0	W. Bradshaw	8,162 11 1
John Baines	8,391 10 7	Cartmell & Son	8,157 6 0
T. Livesey	8,325 0 0	Croft & Sons*	7,925 0 0
P. A. Baines	8,310 0 0		

[Surveyor's estimate, £8,300.]

SIDCUP.—For the new police-station at Sidcup :—

Lawrance & Sons	£8,798	Sydney Hart	£8,327
G. Parker	8,490	Higgs & Hill, Ltd.	8,284
Graham & Co.	8,489	Thomas Knight	8,089
Charles Ansell	8,383	Burman & Sons	8,075
Holloway Bros.	8,350	Chessum & Sons	7,977
Smith & Sons, Ltd.	8,338		

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

CANTERBURY-ROAD. — Improvements (boys' and girls' departments).—Providing new staircases, cloakrooms, and lavatories ; also boys' teachers' room ; extending classroom A to accommodate 60 ; re-dividing and re-stepping classrooms B, C, and D ; providing new drainage scheme, new fittings for water-closets, new boiler-room, and low pressure hot-water apparatus, improving lighting of junior mixed school. Revised accommodation : boys, 268 ; girls, 268 ; infants, 387 ; total, 923. Loss of 36 places :—

Lawrance & Sons	£6,705	Johnson & Co., Ltd.	£6,298
Bulled & Co.	6,619	W. Downs	6,292
F. & H. F. Higgs	6,531	Holliday & Greenwood	5,997
Lorden & Son	6,505	W. Smith	5,838
Garrett & Son	6,376	J. Appleby*	5,778
Marsland & Sons	6,335		

OFFORD-ROAD (P.T.C.)—Wiring, &c., for electric lighting :—

Weston & Co.	£370 0	Peto & Radford, Ld.	£331 0
Drake & Gorham	365 5	Comyn Ching & Co.*	324 0

PLASSY-ROAD (Enlargement).—Extending existing low-pressure hot-water apparatus to six new classrooms :—

Morris & Co.	£223 0	Wenham & Waters, Ltd.	£185 0
J. Grundy	220 0	Vaughan & Brown, Ltd.	182 0
Wontner-Smith, Gray, & Co.	209 0	Duffield & Sons*	157 0
G. & E. Bradley	186 10		

Supply of Black Drill, on a running contract :—

Harriet Evans	£2 7 3	per piece of 36 ft. by 50 in. to 51 in.
Dowler & Son	1 15 0	per piece of 36 yd.
Janes & Son	1 14 0	per piece of 36 ft. by 50 in.
Janes & Co.*	1 2 4½	per piece of 36 ft. by 49 in.

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E normous losses to Buildings have occurred by the action of cold water from the fire engine. This partition was not affected at the trial.
D irections to fix are sent. Any labourer can fix it.

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NO PART OF THIS ISSUE HAS BEEN UNDERWRITTEN.

The List will OPEN on TUESDAY, March 12th, and will be CLOSED on or before 4 p.m. on WEDNESDAY, March 13th, 1901, for Town and Country.

WM. OLIVER, SONS, & HOWARD, Limited.

(Incorporated under the Companies Acts, 1862 to 1900.)

SHARE CAPITAL - - £290,000.

100,000 5½ per Cent. Cumulative Preference Shares of £1 each	£100,000
190,000 Ordinary Shares of £1 each	£190,000
	£290,000

The Preference Shares rank both as regards dividend and Capital in priority to the Ordinary Shares, but without any further right to participate in the profits or assets. It is proposed to pay the Preference Dividends in January and July.

One half of the surplus profits in any year, after payment of a dividend of 10 per cent. on the Ordinary Shares, will be at the disposal of the Directors, and may be applied by them from time to time in any manner they may think fit for the benefit of any Director, Managing Director, or employee, present or past, of the Company, but no division of such surplus profits in any year shall be made unless a sum equal to not less than 7½ per cent. of the net profits of the year has been set aside for reserve.

THERE WILL ALSO BE ISSUED—

£150,000 of 4½ per Cent. First Mortgage Debenture Stock.

(Part of an Authorised Issue of £175,000—all ranking *pari passu*.)

One third of the issued Capital of each class will be taken by the Vendors in part payment of their purchase-money, and the balance, consisting of

£100,000 4½ per cent. First Mortgage Debenture Stock in multiples of £10,
66,667 5½ per cent. Cumulative Preference Shares of £1 each,
126,667 Ordinary Shares of £1 each,

is now offered for Subscription at par, payable as follows:—

	Shares.	Debenture Stock.
On Application..	2s. 6d. ..	10 per cent.
On Allotment	7s. 6d. ..	40 ,,
On 30th April, 1901	10s. 0d. ..	50 ,,

The Debenture Stock will be secured by a Trust Deed constituting a specific first mortgage on the freehold and leasehold properties purchased and a floating first charge upon the undertaking of the Company. The Debenture Stock will become repayable in the event of any audited balance sheet of the Company showing assets (exclusive of goodwill) less than 150 per cent. of the Debenture Stock for the time being outstanding.

The interest on the Debenture Stock will be payable half-yearly, on the 1st April and 1st October, the first payment to be on the 1st October next on the amount then paid from the respective dates of payment. The Stock will be redeemable at any time after 1911 at the option of the Company on six months' notice at £105 per cent.

In the event of the Debenture Stock being enforced by reason of the voluntary liquidation of the Company, it will be redeemable at £105 per cent.

The Debenture Stock will be transferable when fully paid in multiples of £1, but no holding of less than £10 will be allowed.

DIRECTORS.

Sir RICHARD FARRANT (Deputy Chairman and Managing Director of the Artizans', Labourers', and General Dwellings Company, Ltd.), 16, Great George-street, Westminster, S.W. } Chairman.
JOSEPH ERNEST OLIVER, 120, Bunhill-row, E.C. Timber Merchant. }
ALEXANDER LIDDON HOWARD, 109, Fenchurch-street, E.C. Timber Merchant } Managing
EDWARD THOMAS OLIVER, 120, Bunhill-row, E.C. Timber Merchant. } Directors.

TRUSTEES FOR DEBENTURE STOCK HOLDERS.

THE CITY SAFE DEPOSIT & AGENCY COMPANY, Limited, 13, Throgmorton-avenue, E.C.

SOLICITORS.—ASHURST, MORRIS, CRISP, & CO. 17, Throgmorton-avenue, E.C.

BANKERS.

LONDON JOINT STOCK BANK, Limited 5, Princes-street, E.C.
LONDON AND COUNTY BANKING COMPANY, Limited, 21, Lombard-street, E.C.

AUDITORS.

SINGLETON, FABIAN, & CO. Chartered Accountants, 8, Staple Inn, W.C. and 34, Nicholas-lane, E.C.

SECRETARY.
ERNEST R. PHARE.

TEMPORARY OFFICE.
109, FENCHURCH STREET, E.C.

REGISTERED OFFICE.—120, BUNHILL ROW, E.C.

PROSPECTUS.

THIS Company has been formed to acquire (1), the business of Messrs. Wm. Oliver & Sons, of 120, Bunhill-row, E.C. Wainscot, Mahogany, and Hardwood and General Timber Merchants, and (2), the Hardwood portion of the business of Messrs. W. W. Howard Brothers & Co. of 109, Fenchurch-street, E.C. with which Mr. A. L. Howard has been more particularly associated, and to whom its success to a great extent is due.

The business of Messrs. Wm. Oliver & Sons has been established upwards of half a century, and occupies the leading position in the Hardwood trade, having a world-wide reputation for seasoned hardwoods of all descriptions. Mr. Thomas Oliver, who is the sole proprietor, has been induced to part with it and assent to this amalgamation, as he is desirous, owing to ill-health and for family reasons, of relinquishing active control, and he realizes that substantial advantages will result from the amalgamation of two businesses which have hitherto been carried on in competition. He has, moreover, great confidence in Mr. A. L. Howard, who has had very large experience of this class of business, and the fact that Mr. Howard will be actively associated in the management of the amalgamated concern has had considerable weight with him.

Continuity of management will be further secured by the presence on the Board of Messrs. E. T. Oliver and J. E. Oliver, nephews of Mr. Thomas Oliver, who have for twenty-three and sixteen years respectively been associated with the business and have largely helped to place it in the unrivalled position which it now occupies. The premises acquired by the Company comprise:—

From Messrs. WM. OLIVER & SONS.
1. Head Office and Storage Yard, 120, Bunhill-row, E.C.
2. Britannia Wharf, Eagle Wharf-road, Shoreditch-walk, N.
3. Bridge Wharf, Wharf road, City-road, N.
4. Private Storage Shed, South Quay, London Docks, E.
5. Storage Wharf, East Ferry-road, Millwall, E.

From Messrs. W. W. HOWARD BROS. & CO.
1. Part of Crown Wharf, Canning Town, E.
2. Crown Saw Mills, Canning Town, E.
3. Storage Wharf, Shipwright-street, Canning Town, E.

Messrs. W. Oliver & Sons' premises are situated advantageously, and are conveniently arranged for the purpose of a business in dry hardwoods in the City of London, and are amongst the largest of the kind in the kingdom. They are all leaseholds for various terms, the rents of which amount in the aggregate to £2,321 10s. per annum.

Messrs. W. W. Howard Bros. & Co.'s premises are partly freehold and partly long leasehold, of which the aggregate rents amount to £286 7s. 6d. per annum.

The wharves and saw mills at Canning Town have been acquired and converted of late years for the purpose of the hardwood business and have been specially arranged on a practical and economical plan with the latest electrical and other appliances, after a long experience of what is required. The actual storage space, all under cover, is very large. There is free waterway, and these premises are in close proximity to the Docks and Receiving Goods Stations of the principal railways.

The total area of all the timber depots of the combined firms is from six to seven acres.

Both firms keep in stock all the various thoroughly seasoned hardwoods in demand, so that all requirements can be met at the shortest notice.

The customers of the two firms include the Admiralty, War Office, County Councils, Corporations, Railway Companies, Pianoforte Makers, Ship Builders, and other consumers of seasoned hardwoods used in the fittings of Mansions, Banks, Offices, Railway Carriages, and General Joinery and Cabinetmaking industries.

The profits of the two businesses from their foundation to the present time have on the whole, steadily increased and the Directors have every confidence that the amalgamation of the two firms will ensure still better results.

Messrs. Singleton, Fabian, & Co. Chartered Accountants, have examined the books of both firms, in view of the formation of this Company, and their certificate is as follows:

"34, Nicholas-lane, Lombard-street, London, E.C. and 8, Staple-inn, W.C.
"12th February, 1901.

"To Messrs. Ashurst, Morris, Crisp, & Co. 17, Throgmorton-avenue, E.C.

"DEAR SIRS,—We have examined the accounts of Messrs. William Oliver & Sons, and of the Hardwood portion of the business of Messrs. W. W. Howard Bros. & Co.

"Messrs. William Oliver & Sons have been in the habit of taking stock only once every two years, on the 31st March. We have accordingly investigated their accounts for the four years ended 31st March, 1900.

"We find that after making necessary adjustments, and, in our opinion, a sufficient allowance for Bad and Doubtful Debts and Depreciation, but without charging interest on Capital or Messrs. J. E. and E. T. Oliver's Remuneration, the profits were as under:—

"Two years ended 31st March, 1898	£48,689 7 6	
"Two years ended 31st March, 1900	£55,722 7 0	
"Or an average annual profit of		£25,952 18 8

"The accounts of Messrs. W. W. Howard Bros. & Co. we have investigated as on the various dates on which they took stock from the 1st May, 1897, to the 31st December, 1900. We have been able to ascertain the gross profit made on their Hardwood Department as distinguished from their profit on other business, but as the expenses of conducting the business are common to the whole business, it is impossible to ascertain the actual expenses of the Hardwood Department as distinguished from the other departments.

"We are of opinion that the expenses of conducting the Hardwood business of W. W. Howard Bros. & Co. do not proportionately exceed the expenses of conducting Messrs. William Oliver & Sons' business, and we have accordingly deducted from the gross profit of the Hardwood Department of Messrs. W. W. Howard Bros. & Co.'s business a sum for expenses, bad debts, and depreciation based upon the expenses, &c. of conducting the business of Messrs. William Oliver & Sons, and on this basis we find, after making the necessary adjustments, the profit before charging interest on Capital or Partners' Remuneration to be as under:—

"For the 20 months ended 31st December, 1900 .. £15,069 19 10		
"Equal to per annum	£9,042 0 0	
"For the 12 months ended 31st December, 1899	£11,950 19 2	
"For the 12 months ended 31st December, 1900	£14,256 15 0	
"Or an average annual profit of		£11,257 10 0
"The Total Profits of these Two Businesses thus show an Annual Average of ..		£37 210 8 8

"We are, Gentlemen, yours faithfully, SINGLETON, FABIAN & CO."

Messrs. W. W. Howard Bros. & Co. have placed their books at the disposal of Messrs. Singleton, Fabian, & Co. and, without taking any responsibility for the method of calculation adopted by them, believe that the result, showing an annual average profit of £11,257 10s. on the hardwood portion of their business, is a fair estimate.

The interest on £150,000 of 4½ per cent. Debenture Stock will require	£6,750
And 5½ per cent. on £100,000 of Preference Shares will require	5,500
	£12,250
Deducting this amount from the above-mentioned average annual profit of £37,210 8s. 8d. there remains for Management, Reserve Fund and Dividend on £190,000 of Ordinary Shares the sum of	£24,960 8 8

The assets acquired by the Company comprise:

Freehold and Leasehold Property, fixed and loose plant and machinery	£30,500
Stocks	200,600
	£231,100
To which must be added working capital provided by this issue amounting to	52,900
Giving total assets (exclusive of goodwill)	£284,000

The price to be paid for the business of Messrs. Wm. Oliver & Sons is £260,000, made up as follows:—

Stock	£140,600
Fixtures and plant	1,400
Goodwill (including leaseholds)	118,000
	£260,000

The Stock is taken at the stock-taking prices on the 31st March, 1900, as and from which date the business with its profits is taken over by the Company, subject to the payment to Mr. Thomas Oliver, of interest at the rate of five per cent. per annum on the purchase price of £260,000, with an additional sum, for management, at the rate of £2,000 per annum from the above date. The Vendor reserves the book debts, bills of exchange, and cash owing or belonging to him in connexion with the business on the 31st March, 1900, and he is to pay the debts owing by him in connexion with the business as at that date. The various leasehold premises of the firm have not been separately valued, but are included in the purchase price.

The price to be paid for the hardwood portion of the business of Messrs. W. W. Howard Bros. & Co. is £127,100, made up as follows:—

Stock	£60,000
Freehold and Leasehold Premises	21,100
Machinery	8,000
Goodwill..	38,000
	£127,100

The Stock is taken at the stock-taking prices of 31st December, 1900, as appears from Agreement 2 below. This is less (by about £8,000) than the whole of Messrs. Howard's hardwood stock. The small balance will be taken over as therein provided. The business with its profits is taken over by the Company from the 31st December, 1900, subject to the payment to Messrs. Howards of interest at the rate of 4½ per cent. per annum on the sum of £78,943 from that date. The Vendors reserve the book debts, bills of exchange, and cash owing or belonging to them in connexion with the business on the 31st December, 1900, and they are to pay the debts owing by them in connexion with the business as at that date. The freehold and leasehold premises have been valued by Messrs. Vigers & Co. at £21,100.

Both Vendors stipulate that one-third of the Debenture Stock, Preference Shares, and Ordinary Shares respectively constituting the present issue, shall be paid to them in proportion to their respective purchase prices, so that Mr. Thomas Oliver will receive £33,583 in fully-paid Debenture Stock, £22,388 in fully-paid Preference Shares, and £42,538 in fully-paid Ordinary Shares, together £98,509, and Messrs. W. W. Howard Bros. & Co. will receive £16,417 in fully-paid Debenture Stock, £10,945 in fully-paid Preference Shares, and £20,795 in fully-paid Ordinary Shares, together £48,157. As regards the balance, Mr. Oliver is willing to receive payment of a further sum of £101,491, either in cash or in fully-paid shares of either class, or fully-paid Debenture Stock, or partly the one and partly the other, at the option of the Company, the remaining £50,000 being payable in cash. Similarly, Messrs. Howard are willing to receive in cash or fully-paid Shares or Debenture Stock, at the option of the Company, a further sum of £1,843, the balance, £7,100, being payable in cash. The sum which the Vendors are prepared to accept in fully-paid Shares being £200,000, the minimum subscription on which the Directors may proceed to allotment is the balance of the Share Capital, viz. £90,000.

The Vendors will pay the costs, charges, and expenses of and incidental to the formation and registration of the Company, including Stamp Duty, and fees payable in respect thereof, and of the purchase of the said businesses and properties, and including brokerage (3d. per Share and ¼ per cent. on Debenture Stock all taxed on Brokers' stamped application forms) and generally all expenses of the Company up to the date of the first general allotment of its Shares and Debenture Stock. The estimated amount of these preliminary expenses is £5,500, besides the negotiation fee to Sir Richard Farrant mentioned below.

Mr. A. L. Howard is interested in the said sum of £127,100, payable to his firm to the extent of £79 618, in accordance with the provisions of the Deed of Dissolution of his partnership below mentioned. Mr. A. L. Howard and Mr. E. T. Oliver, as Managing Directors, and Mr. J. E. Oliver, as a Manager, will receive salaries of £1,700, £1,200, and £450 respectively, in addition to their Directors' fees. Sir Richard Farrant will receive from the Vendors a negotiation fee of one per cent. of the issued Share and Loan Capital of the Company, and the call of 5,000 Ordinary Shares at par. The Articles of Association provide, with regard to the qualification and remuneration of Directors, as follows:—

Article 73.—The qualification of a Director shall be the holding of Shares of the Company of the nominal amount of £2,000.

Article 74.—The Chairman of the Board of Directors shall be entitled to receive by way of remuneration in each year £500, and each other Director shall be entitled to receive by way of remuneration in each year the sum of £250. Any Director holding office for part of a year shall be entitled to a proportionate part of such remuneration. The Company in General Meeting may increase the amount of such remuneration, either permanently or for a year or longer term.

Article 76 empowers the Board to establish local boards, local managing or consulting committees, or local agencies in the United Kingdom or abroad, and appoint any one or more of their number, or any other person or persons, to be members thereof, with such powers and authorities under such regulations for such period, and at such remuneration as they may deem fit, and may from time to time revoke any such appointment; appoint from time to time any one or more of their number to be Managing Director or Managing Directors, or Manager or Managers of the Company's business or any portion thereof on such terms as to remuneration and with such powers and authorities and for such period as they may deem fit, and may revoke such appointment; grant to any Director required to go abroad or to render any other extraordinary service, such special remuneration for the services rendered as they think proper.

The following Contracts have been entered into:—

1.—An Agreement dated 5th March, 1901, between Thomas Oliver, of No. 120, Bunhill-row, E.C. and the Company, for the acquisition by the Company of the before mentioned business and properties of Messrs. Wm. Oliver & Sons. The particulars of the properties taken over are specified in the Schedule to this Agreement.

2.—An Agreement dated 5th March, 1901, between William Walters Howard Alexander Liddon Howard, and Ernest Walters Howard, all of 109, Fenchurch-street, London, E.C. and the Company, for the acquisition by the Company of the hardwood portion of the business of Messrs. W. W. Howard Bros. & Co. and of the before-mentioned properties in connexion therewith, which Agreement also provides for the said Alexander Liddon Howard acting as one of the Managing Directors of the Company for five years. The particulars of the properties acquired are specified in the Schedules to this Agreement.

3.—An Agreement dated 5th March, 1901, between the Company and Edward Thomas Oliver for his acting as one of the Managing Directors of the Company for a term of five years.

4.—An Agreement dated 5th March, 1901, between the Company and Joseph Ernest Oliver for his acting as one of the Managers of the Company for a period of five years.

5.—An Agreement dated 5th March, 1901, between Thomas Oliver, Alexander Liddon Howard, and Sir Richard Farrant.

6.—A deed dated 5th March, 1901, between William Walters Howard, Alexander Liddon Howard, and Ernest Walters Howard, for the dissolution of their partnership, and the allocation of the purchase price.

Copies of such Contracts, and of the proposed Trust Deed for securing the issue of Debenture Stock, together with the Memorandum and Articles of Association of the Company, Messrs. Singleton, Fabian, & Co.'s Certificate, and Messrs. Vigers & Co.'s valuation of the freehold and leasehold premises to be acquired from Messrs. W. W. Howard Bros. & Co. may be seen at the offices of the Company's Solicitors, Messrs. Ashurst, Morris, Crisp, & Co. No. 17, Throgmorton-avenue, E.C. at any time during business hours before the list of subscriptions is closed.

A copy of the Company's Memorandum of Association is printed in the form of the Prospectus, and forms part of the Prospectus.

Applications for Debenture Stock or Shares should be made on the accompanying forms, and forwarded, together with a cheque for the amount payable on application, to either of the Bankers of the Company, at their respective Head Offices, or any of their branches.

If no allotment is made the application money will be returned in full, and where the amount of Stock or the number of Shares allotted is less than that applied for, the surplus will be credited in reduction of the sum due on allotment, and if there then be a balance it will be returned to the applicant.

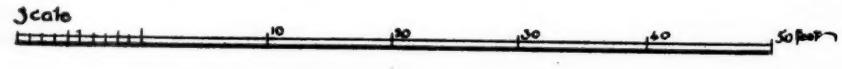
Failure to pay any instalment when due will render the previous payments liable to forfeiture.

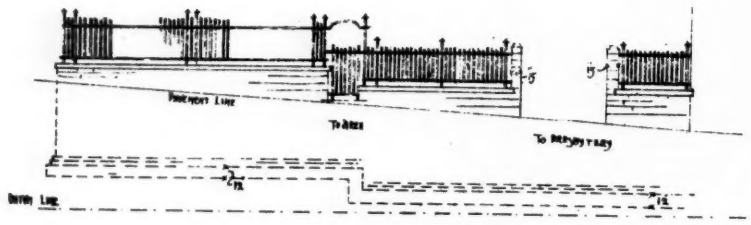
Prospectuses and Forms of application can be obtained at the offices of the Company or from the Bankers or Solicitors.

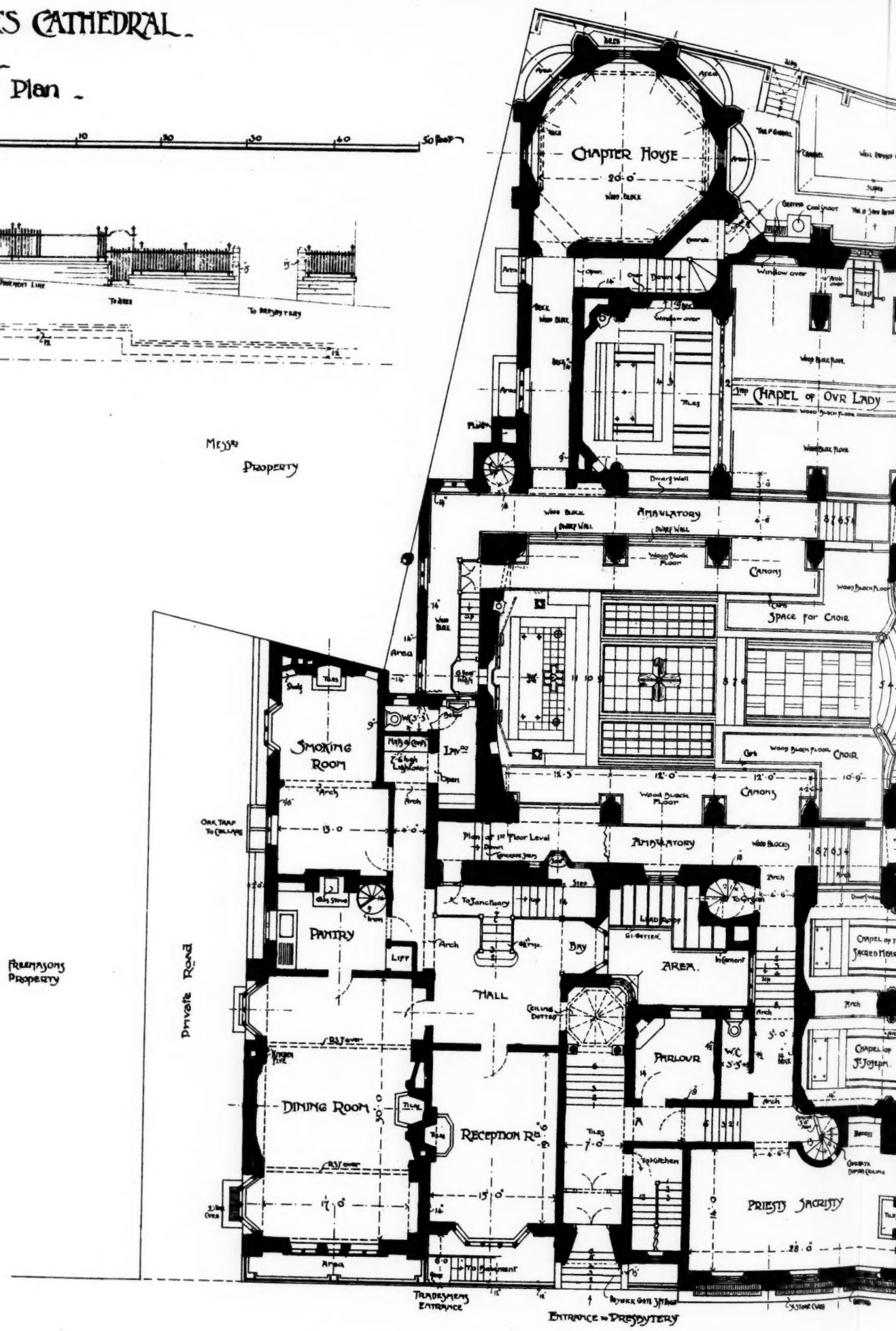
This Prospectus has been duly filed with the Registrar of Joint Stock Companies.

Dated 6th March, 1901.

St ANNES CATHEDRAL.
LEEDS.
Ground Plan.

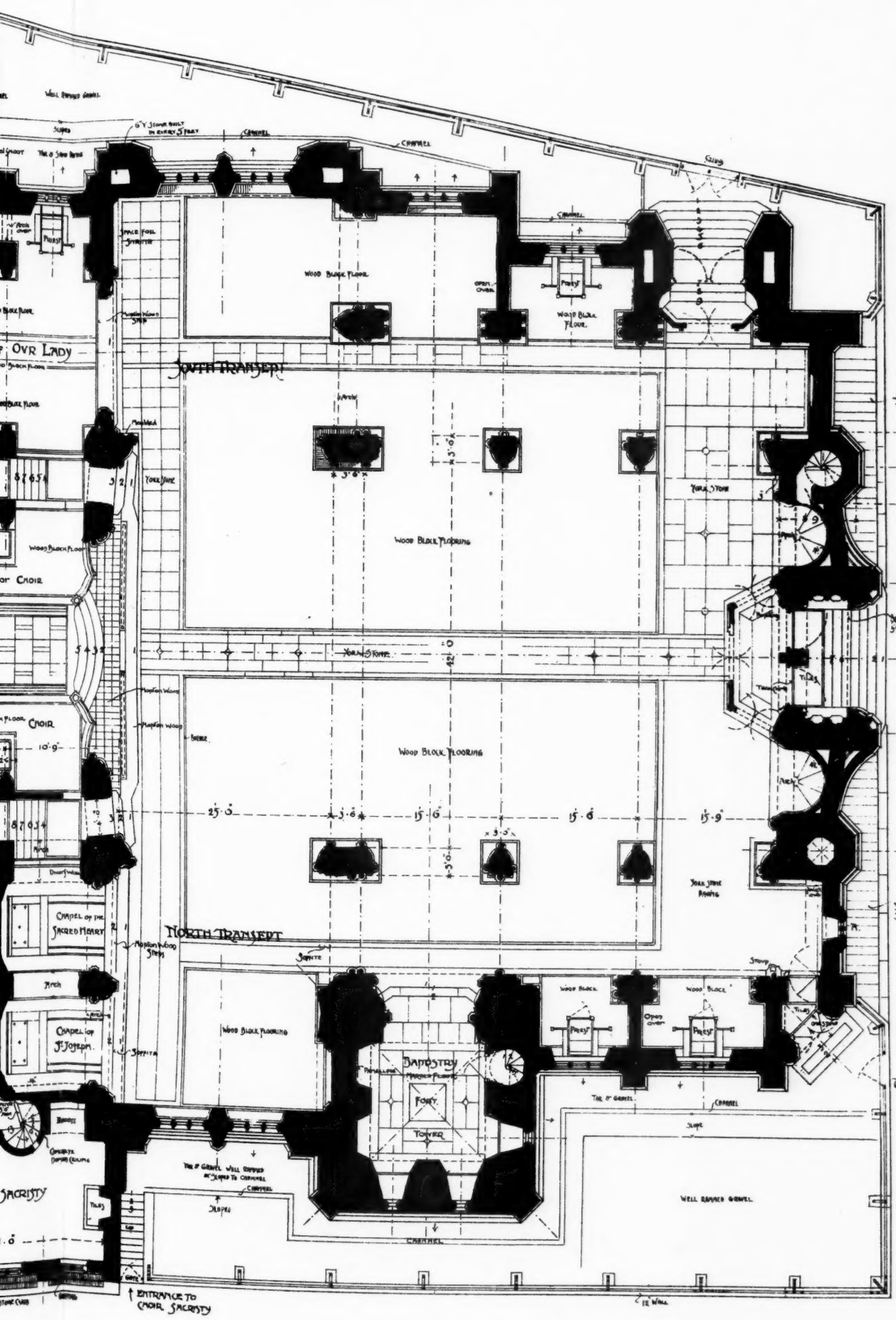






GEORGE STRE

PROPOSED CATHOLIC CATHEDRAL FOR LEEDS.—

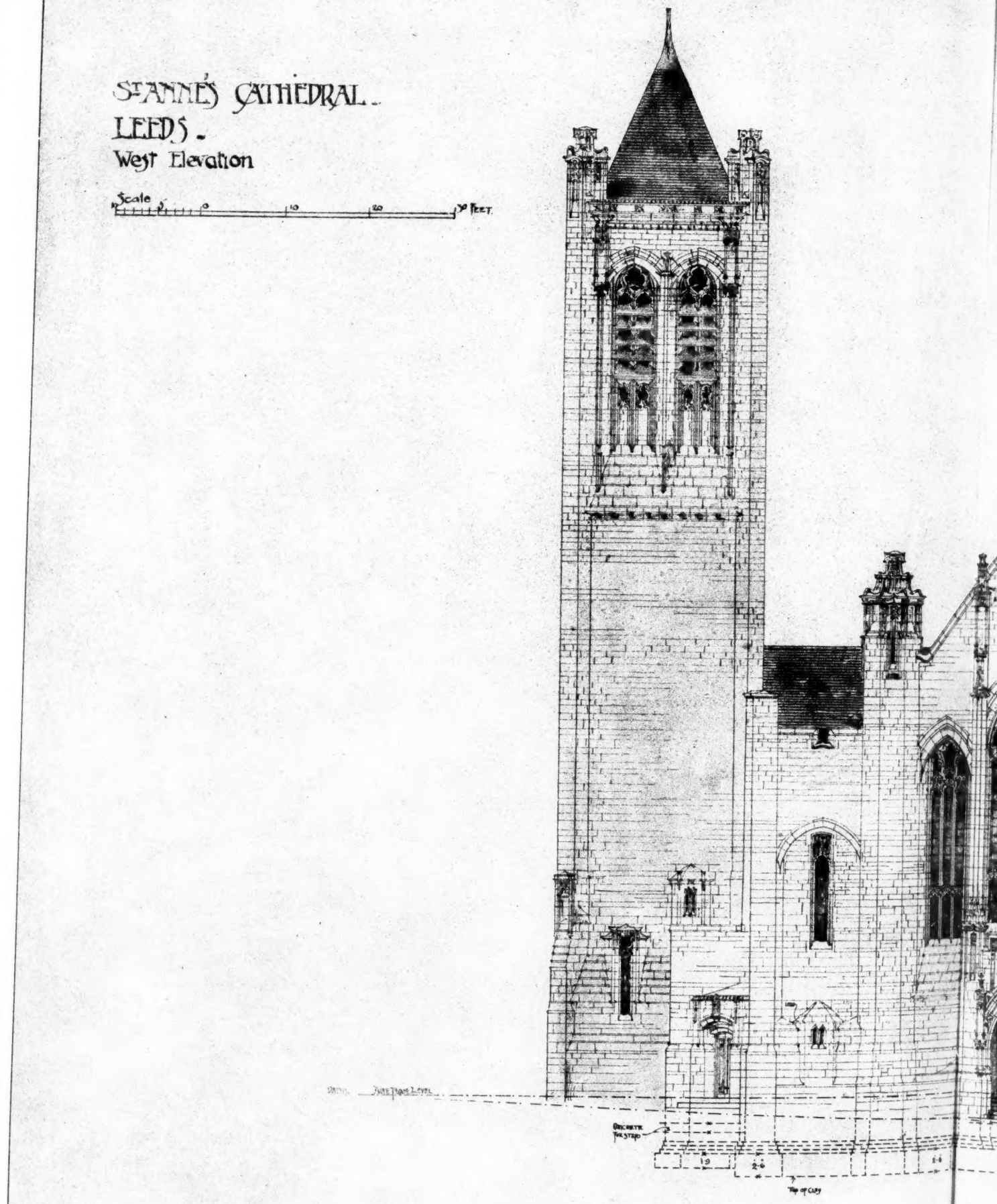


L FOR LEEDS.—Mr. J. H. Eastwood, A.R.I.B.A., Architect.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET. FETTER LANE. E.C.

St ANNE'S CATHEDRAL.
LEEDS.
West Elevation

Scale 0 10 20 Feet



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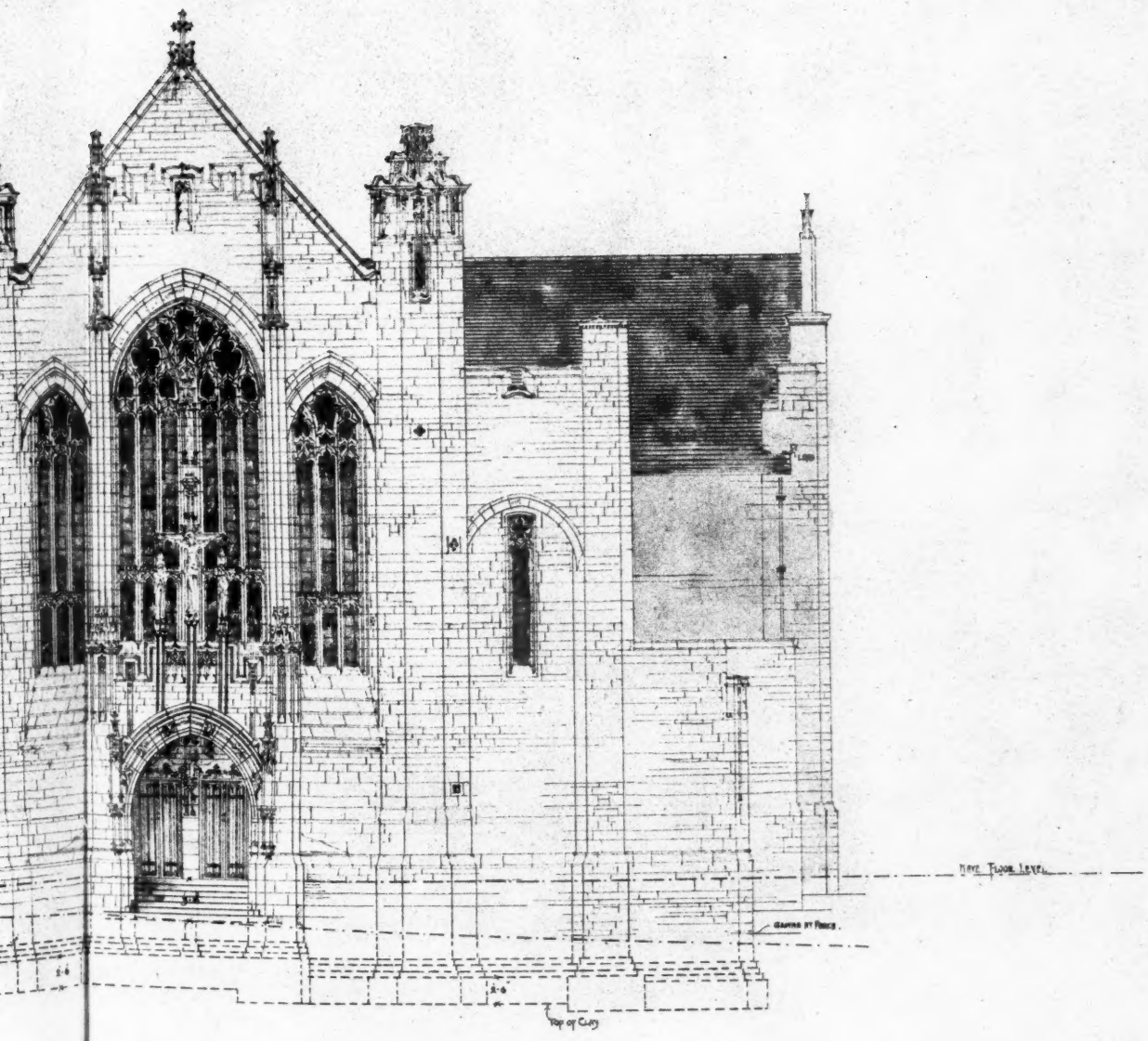


ELEVATION TOWARDS COOKRIDGE ST.

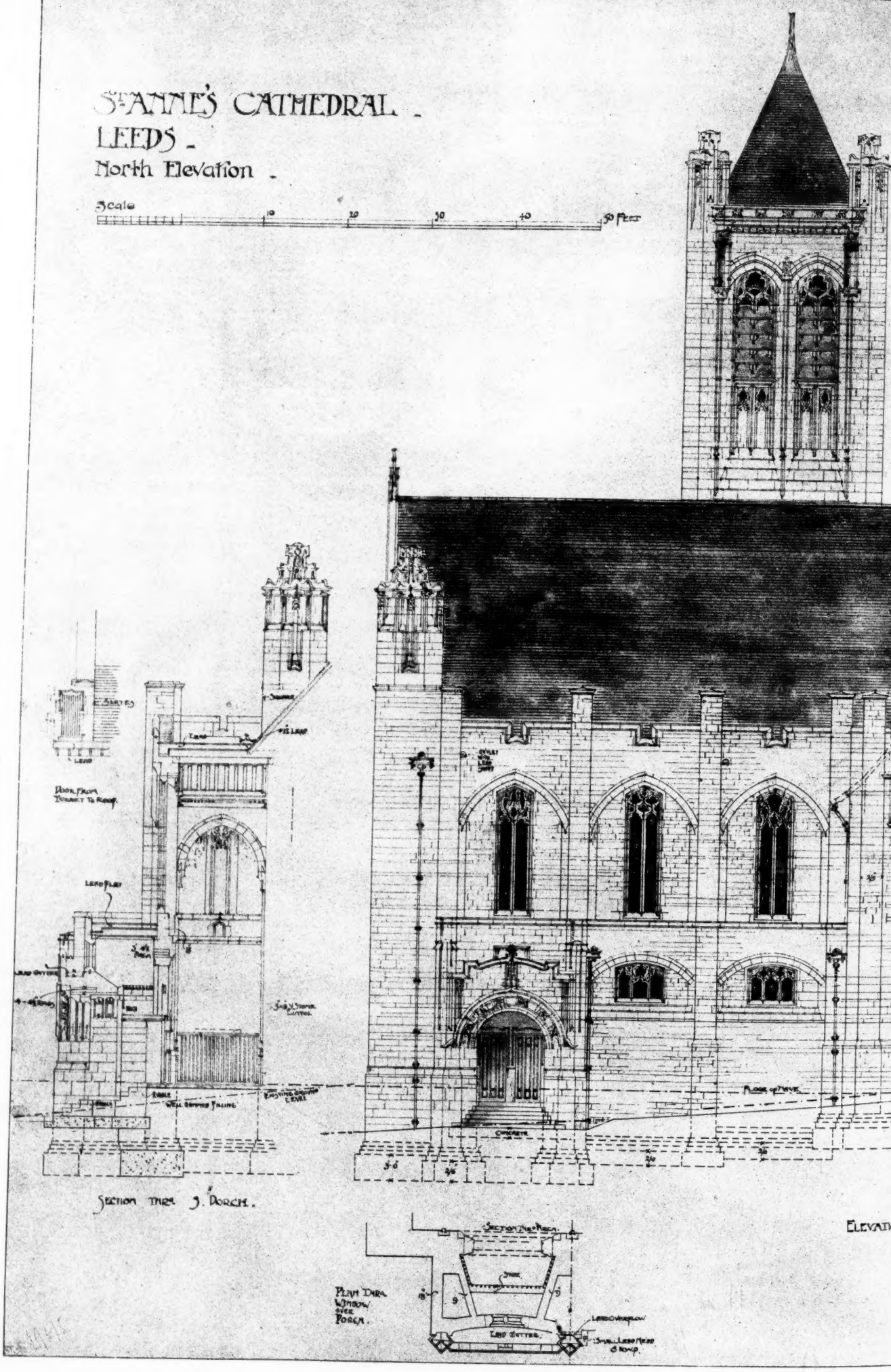
J. H. EASTWOOD. A.R.I.B.A.
Arch.

INK-PHOTO, SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

AL FOR LEEDS.—MR. J. H. EASTWOOD, A.R.I.B.A., ARCHITECT

St ANNE'S CATHEDRAL -
LEEDS -
North Elevation -

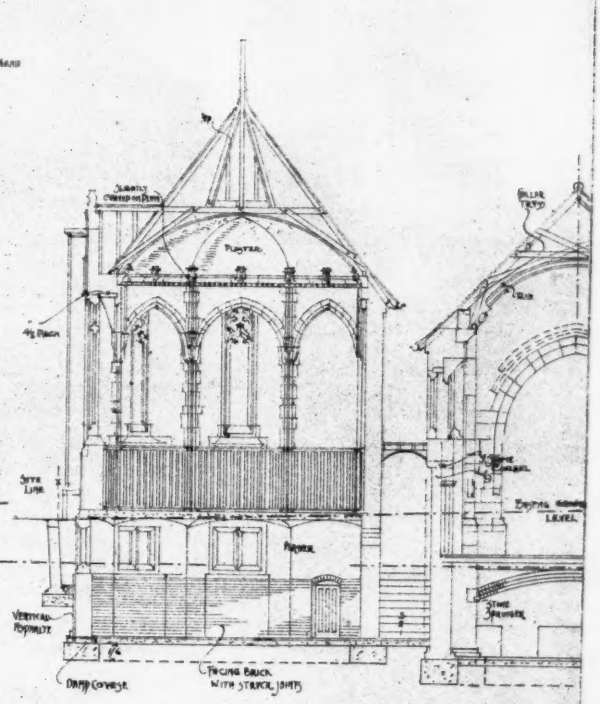
Scale 10 20 30 40 50 Feet



PROPOSED CATHOLIC CATHEDRAL FOR LEEDS.

TOWARDS St ANNES St.

CHAPTER HOUSE.



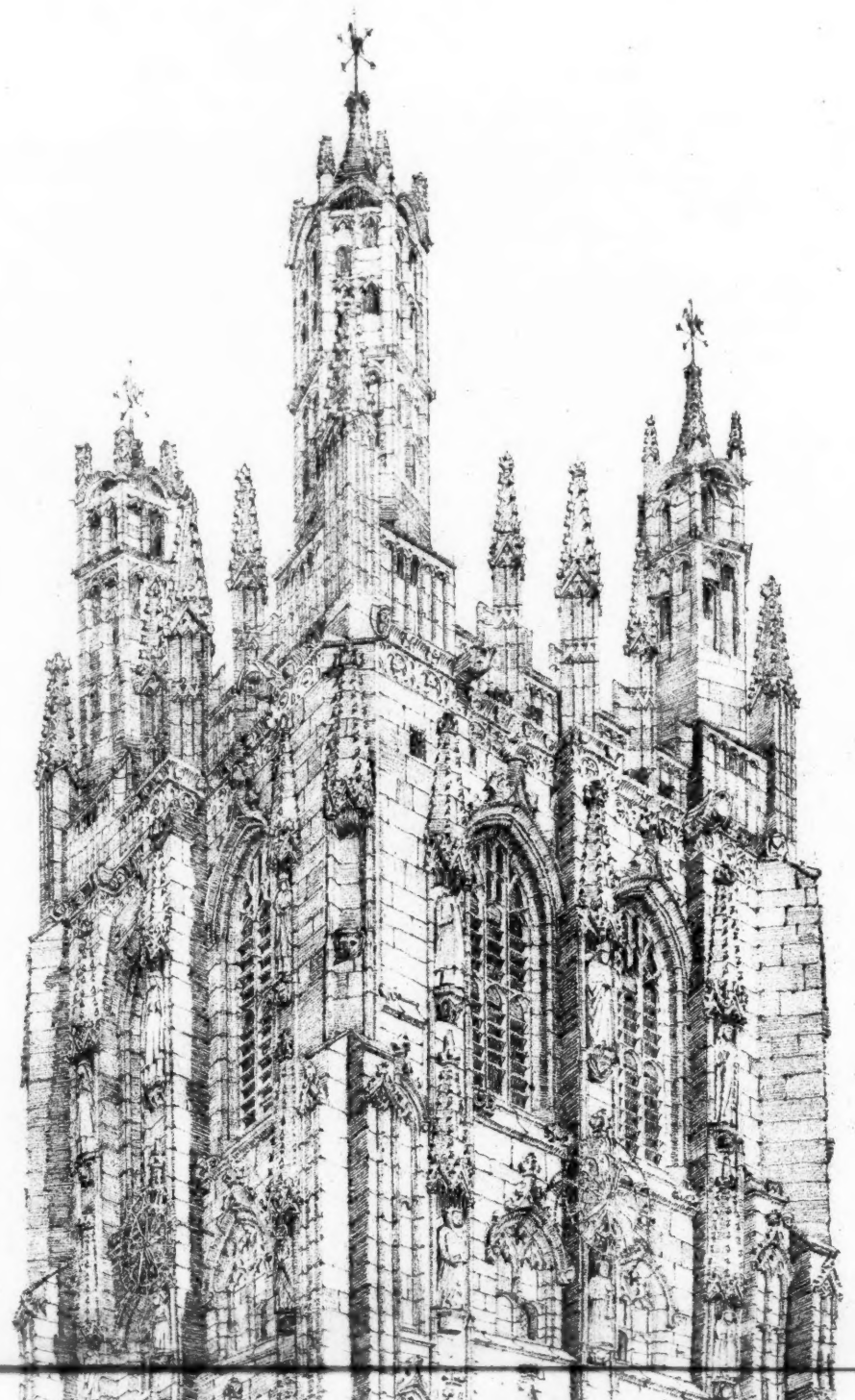
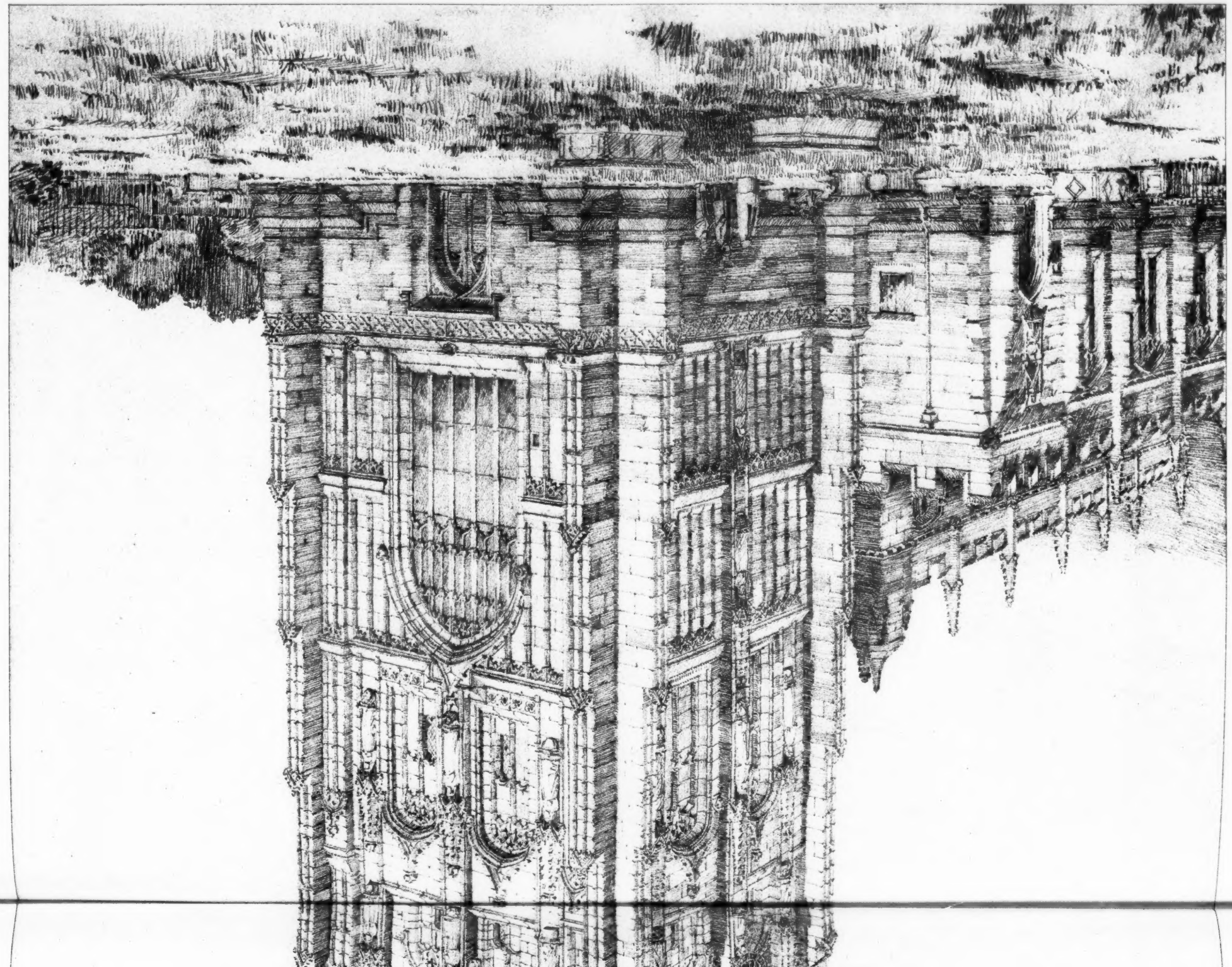
SECTION THRO CHAPTER HOUSE.

J. H. EASTWOOD. A.R.I.B.A.
ARCHT.

INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

L FOR LEEDS.—MR. J. H. EASTWOOD, A.R.I.B.A., ARCHITECT.

TOWER: St GILES' CHURCH~WREXHAM.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